APRIL 12, 1954

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

AUTOMATION

No. 3 in 1954 Management Series

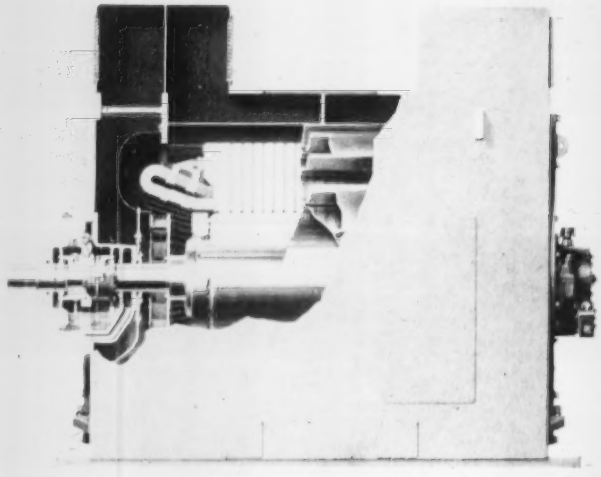
AUTOMATION:

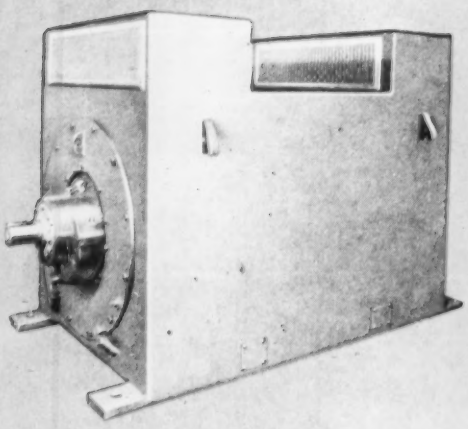
HOW FAR SHOULD YOU GO?

— page 87

CONTENTS — PAGE 5

Redesigned INSIDE AND OUT





ALLIS-CHALMERS

Large 2-Pole Cage MOTORS

New features improve 2-pole motors long known for reliability and low maintenance.

New ventilating principle used features top air intake and discharge *plus* spiral stator core ventilation. Top intakes (available with filters) keep motor clean and make motor room cleaning easy; top discharge adds to personnel comfort. Spiral ventilation — used in turbine generators — assures even internal cooling . . . combines with centrifugal fans and baffled air passages to reduce noise.

Improved bearing design simplifies maintenance, prevents oil leakage. Capsule-type housings — proved in use on other designs — permit inspection of windings without exposing bearings. Oil leakage is prevented by a combination of features, including orifice-metered oil flow, weirs to maintain correct oil level, labyrinth seals, breathers, and annular pressure chambers with atmospheric relief.

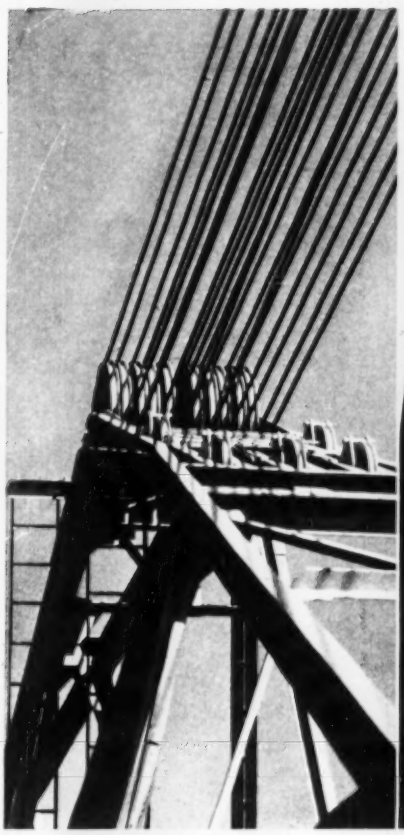
Compact appearance is gained by providing internal space for stator and auxiliary leads, etc.

Features that helped build the Allis-Chalmers 2-pole motor reputation for reliability are retained in the new design. These include proven stator coil design, ample stator coil end bracing, thermally and mechanically stable cage assembly, separate balancing rings, and oxygen-free dew-drop cage bars.

This design available in ratings 900 hp and larger. Ask your A-C representative for Bulletin 05R8123. Allis-Chalmers, Milwaukee 1, Wisconsin.

A-4349

ALLIS-CHALMERS



Strength at the 43 Sheave Points

The two upper photos show points high above the deck of a 50-ton floating crane. This huge equipment, including both crane and seagoing barge, was built by Wiley Manufacturing Company, Port Deposit, Md. It can be towed for long distances, even across the ocean if need be.

In view of the heavy loads to be handled, the Wiley designers foresaw the importance of rugged steel sheave wheels—sheaves that would last a long time under the heavy pressures of the cables. In making their choice, they selected Bethlehem forged and rolled sheave wheel blanks, which were furnished rough machined. This particular job required 43 sheaves ranging from 20½ to 40 in. OD.

Sheave wheels, of course, are but one of the many uses for Bethlehem circular blanks. These sturdy steel products, available in a large number of sections and sizes, are excellent for gears, crane wheels, flywheels, turbine rotors, industrial wheels, and many other parts requiring high strength without excessive weight.

If you haven't used Bethlehem blanks in your own operations, we suggest you give them a try. Sizes run from 10 to 42 in. OD, and the blanks can be furnished annealed or heat treated, as desired.

Why not ask for details? Write or phone today, and we'll gladly furnish complete information.

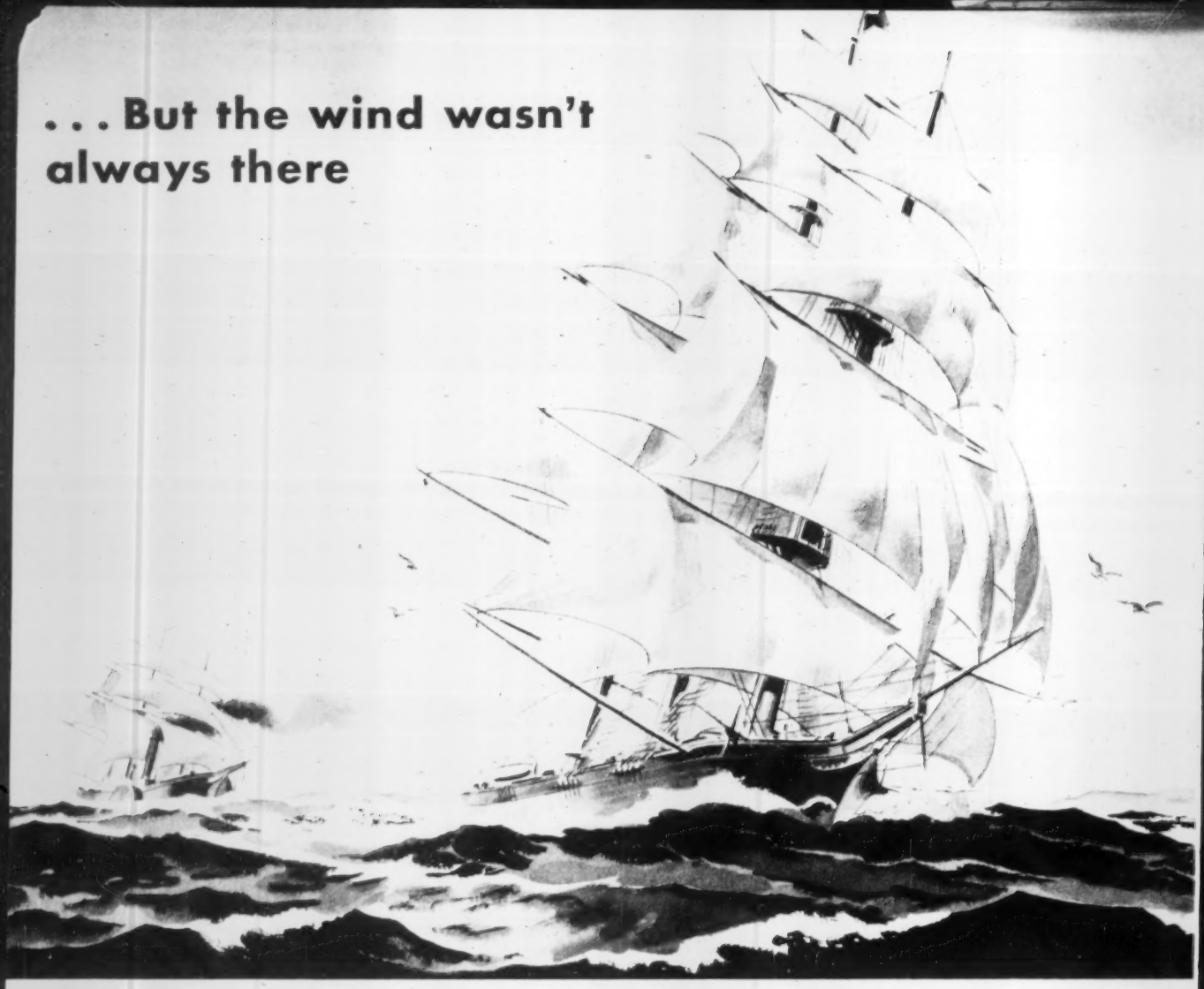
BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export distributor: Bethlehem Steel Export Corporation.

BETHLEHEM STEEL

BETHLEHEM FORGED-and-ROLLED CIRCULAR BLANKS

. . . But the wind wasn't always there



In the Clipper ship era of the 1840's 20 knots with a favoring wind was considered good time — as indeed it would be today. But the wind wasn't always there. In the long run steam won out in the competitive race.

We say, "That's progress" but it's really competition which makes the difference between historic failures and continuing success. In the case of the Clippers something better, more dependable came along — and it will always be that way.

Like everyone else in today's highly competitive market you're certainly looking for new ways to improve product quality and cut manufacturing cost. Very possibly we here at Heald can help. Heald automatic sizing, constant feed throttling, centerless grinding, faster cycles, versatility, transfer type Bore-Matics, battery type equipment and a host of other unique Heald features for faster, better precision finishing are available for a wide variety of jobs. We would welcome the opportunity to show you how a fresh Heald viewpoint can help — on long or short runs, single or multi-purpose setups.

Competition is wonderful when you're *ahead* of it. Our business is to keep you there. That's why IT PAYS TO COME TO HEALD.

THE HEALD MACHINE COMPANY

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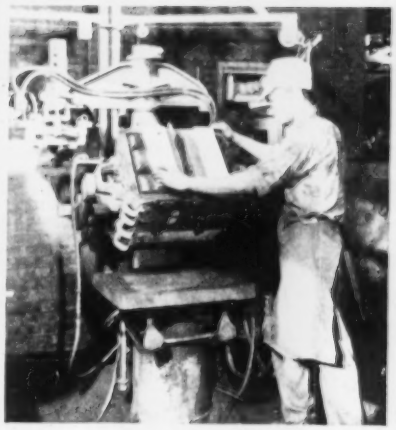
Internal and Rotary Surface Grinding Machines and Bore-Matics

Efficiency is improved... fatigue minimized

by mechanically handling large molds with Osborn Rota-Lifts at this prominent Midwestern foundry. One molder and one machine now do work formerly requiring two men, to cut foundry molding costs.



Foundry costs are less because *Rota-Lift* doubles output per mold

HERE'S a picture of a foundry molder turning out *twice the former production* . . . yet with less than half the effort.

The Osborn Rota-Lift he's using takes all heavy manual work from rolling over and handling the mold. The molder can now use larger flasks . . . each flask produces twice as many castings.

It will pay you to have Osborn study your molding operations. Undoubtedly your Osborn representative will find where production can be simplified and manhours used more efficiently through new and improved Osborn developments in molding and core blowing. Call or write The Osborn Manufacturing Company, Dept. EE-17, 5401 Hamilton Avenue, Cleveland 14, Ohio.

See Rota-Lift at
THE FOUNDRY SHOW
Booth 1115

Another example of
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and advanced engineering

OSBORN

MOLDING MACHINES CORE BLOWERS

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Count BOTH

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WITH

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Multiple-Unit Reset Counter

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Vary-Tallies will do *any* counting job you want in any combination up to 6 banks high, 12 units wide (with a minimum of 2 units wide). Yes, you can count on 'em or with 'em *to your profit* — note these features of construction:

- **Easily Readable from Any Angle . . . Bold figures Always Centered in Window . . . No Glare . . . Figures not Covered by Fingers in Operation**
- **Easily Portable, yet Ruggedly Built for Long Wear**
- **All Parts Corrosion-Resistant; Working parts of Hardened Steel**
- **Separate Counting Units Can be Rotated like Tires on a Car, to Distribute Wear Evenly**
- **Not Affected by Extreme Heat or Cold**
- **Individual Tag Above Each Counter-Window — Not Strip Tabs**
- **Veeder-Root Quality in Every Part**

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This Week in Metalworking

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

Vol. 134 No. 15 April 12, 1954

✓NEWS ✓PRODUCTION-ENGINEERING ✓MARKETS

Metalworking Outlook 39

As the Editor Views the News 43

Renting—How to Go About It 50
Last in a series of three articles on the pros and cons of leasing

Financial Analysis of the Steel Industry facing 54
STEEL's 29th annual survey

Windows of Washington 56

Mirrors of Motordom 61

The Business Trend 65

Men of Industry 69

Automation—How Far Should You Go? 87
No 3 in STEEL's 1954 Program for Management Series

Technical Outlook 97

How to Allow for Shrinkage in Castings 98
Why shrinkage and finish allowances differ

Fastening Costs Take a Nose Dive 100
Metalacing is helping two West Coast sheet metal fabricators make considerable savings. Here's how it works

Design is Key to Simple Control 102
Part II of the Continuous Galvanizing Line. Wheeling eliminated sections for synchronization by controls

Progress in Steelmaking 110
Desulphurization With Rare Earths. Results of tests made using the earths are discussed, pro and con

Beryllium Spikes Alloys for Tough Jobs 118
These alloys have the upper hand commercially. Efforts are being made to develop a pure metal. Types listed

New Products and Equipment 131

The Market Outlook 145
Metal Prices and Composites begin on Page 146

Nonferrous Metals 148

Behind the Scenes 6 Calendar of Meetings 27
Letters to the Editors 10 Obituaries 29
Helpful Literature 143

Editorial, Business Staffs 16. Advertising Index 178. Editorial Index available semiannually. STEEL also is indexed by Engineering Index Inc., 29 West 39th St., New York 18.

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PLA-TANK achieves these vastly improved resistances by carefully controlled variations in either the resin or fiber or both. Now more than ever "*all polyesters are not alike*" and COMMONLY PUBLISHED STUDIES OF POLYESTER PERFORMANCE MUST NOT BE APPLIED TO PLA-TANK SPECIAL MATERIALS.

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NOW . . . you can "prescribe" new PLA-TANK for your own *specific* needs, knowing your tanks will have increased usefulness and longer life.

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WRITE TODAY — *mentioning your requirements, for complete data sheets on new PLA-TANK material.*

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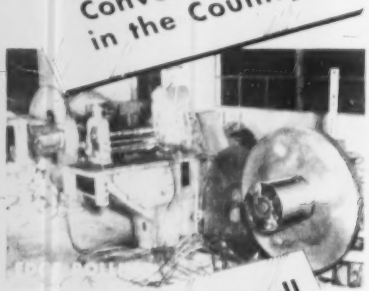

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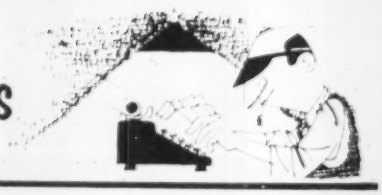
behind the scenes



Private Snow Storms

The Geneva Works of the United States Steel Corp. at Provo, Utah, has achieved a distinction rare among plants of its kind . . . the ability to create its own snow storms.

For three days in a row, we are told, a light snowstorm occurred over the plant, although no snow was reported anywhere else in the general locality.

A Provo weather observer theorized that the freak condition was probably the result of the three-day fog in the area, combined with heat, steam and gasses from the plant. He described the phenomenon as a "local" storm.

A Little Gem

Further to the idea of moving more products faster is this poem we happened across on our reading the other p.m.:

The constant drip of water wears
away the hardest stone,
And the constant gnaw of Towser
masticates the toughest bone,
And the constant, cooing lover
carries off the blushing maid,
And the constant advertiser is the
one who gets the trade.

Advertisers' Digest

Dollar-Wise, Weld-Foolish

Hey! Did you read the one about the $300,000 robbery engineered by a couple of "welding-wise burglars." Happened in Seattle on Washington's birthday, no less.

Seems the safesmiths used drills which had been lengthened by welding on extensions of a special-purpose, high-strength alloy.

Irving Shaft, district engineer for the Eutectic Welding Alloys Corp., identified the weld material as Eutectrod 16 FC. His information narrows the field and may materially assist the FBI in finding its men.

Shaft pointed out that the welding job had been done by amateurs. Eutectrod 16 was designed for high-strength joints up to 100,000 psi. To join shanks to drills, a simple butt joint would have been adequate. The fact that the joints had been beveled and the alloy used as a filler metal was a clear indication of a lack of knowledge of this particular alloy. Furthermore, it is unlikely that a professional would have left the joints as rough and unfinished as these were.

The federal men are now following up this lead as an entirely new line of investigation. If the burglars did the welding themselves, they must have purchased the material from a distributor or user. If they hired the job done, they struck on a shop welder unfamiliar with the correct welding procedure.

Crime doesn't pay. Neither does sloppy welding!

Reprints Available

In today's issue is the final installment in a series of three articles on the pros and cons of leasing. During the past two weeks, our editors have been receiving numerous requests for reprints of this series. They are currently making arrangements to package the trio for those of you who want them.

If leasing is an issue the folks in your plant are currently studying, these articles can help you answer many of the questions which will come up in your discussions.

We are told that if you address your requests to STEEL's Reader Service Department, the number of reprints you require will be sent sometime around Apr. 21.

The Snafued Snifter

Down at Kaiser Metal Products Inc. in Bristol, Penn., they tell this one: Among the company's products, which range from bathtubs to jet plane airframe sections, are aluminum Aangtip fuel tanks for jet aircraft. As these must be entirely free of leaks, Freon gas is pumped into the tanks under pressure and a gas detector, called a "sniffer," is used to detect possible leaks.

Not too long ago, a container of carbon tetrachloride was upset in the area. The sensitive "sniffer" practically sniffed itself wild trying to find the little leaks that weren't there. So did the inspectors.

Shrdlu

(Metalworking Outlook—Page 39)

HERE'S WHY and WHEN

Four of the complete line of Hannifin lever-type Air-Operated Presses that include over 30 basic models in capacities up to 18 tons.

WE RECOMMEND

HANNIFIN AIR PRESSES

. . . *for Production Operations* involving assembly, marking, staking, riveting or punching of small parts. Hannifin ½ and 1-ton air presses are fast, safe and economical . . . in both initial cost and operating cost.

. . . *for Bigger Pressing Operations* where infrequent use would not warrant the purchase of a hydraulic press. Hannifin lever type air presses are low in first cost . . . assure efficient, uniform work . . . are far more economical to operate than out-moded manual presses.

Select the press you need from the complete Hannifin line of air presses. All operate off ordinary shop air supply. There are over 50 basic models from which to choose, many for either bench or floor mounting. Capacities range from ½-ton to 18 tons . . . ram strokes up to 15 inches . . . daylight to 46 inches . . . reach to 12 inches.

Hannifin Series M ½ and 1-ton Air Presses. Supplied with or without electric valves for push button operation.

Hannifin Series A ½ and 1-ton Air Presses. Notice these have adjustable gap.

WRITE FOR BULLETINS 250, 251 and 252

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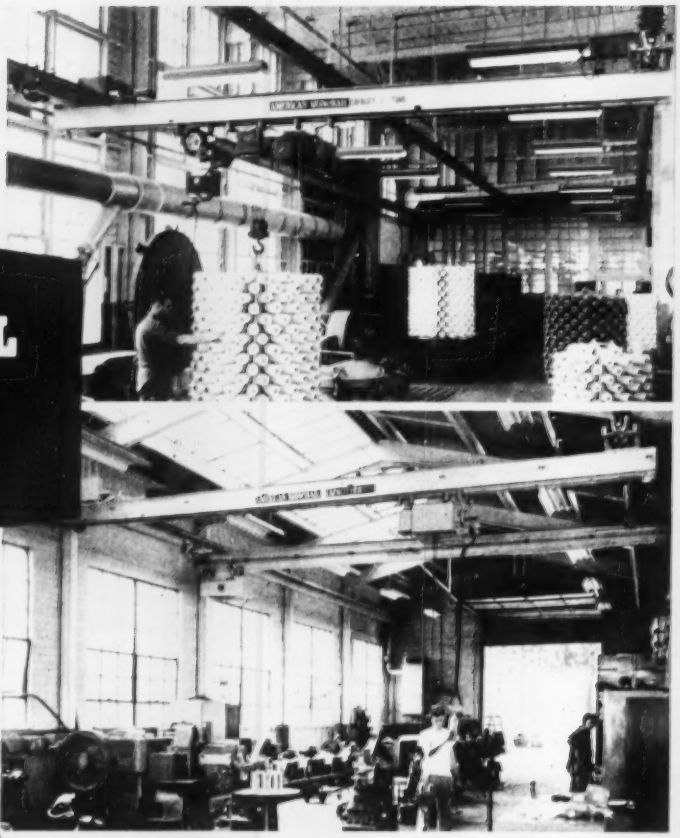
USE

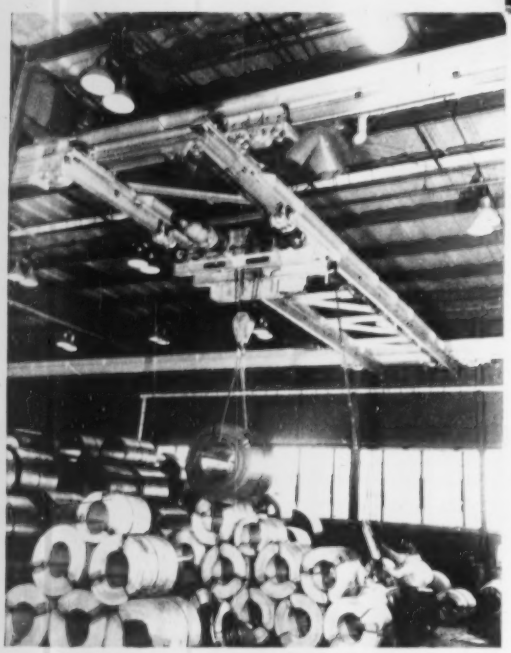
MONORAIL CRANES



. . . Where Space is Limited

. . . To Handle Variable Jobs

. . . For Low Maintenance Cost



These are just a few reasons why American MonoRail Cranes are gaining in popularity and are being installed in increasing numbers of plants the country over. Call in your American MonoRail representative and have him tell you all the advantages of MonoRail Cranes such as—ease of handling—smooth travel—strength—safety interlocks—power operation and **interlocking carrier service between and beyond the craneways.** Consultation in connection with any handling problem is available without obligation.

Send for your copy of C-1 Bulletin

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13102 ATHENS AVENUE • CLEVELAND 7, OHIO

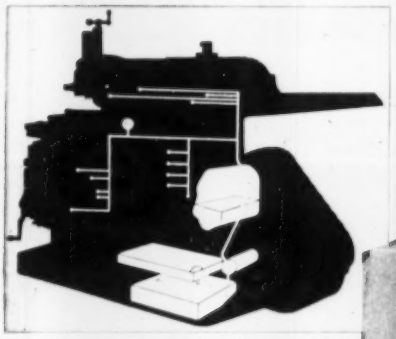
50 lbs. oil pressure

IS NECESSARY WITH A CUT LIKE THIS...

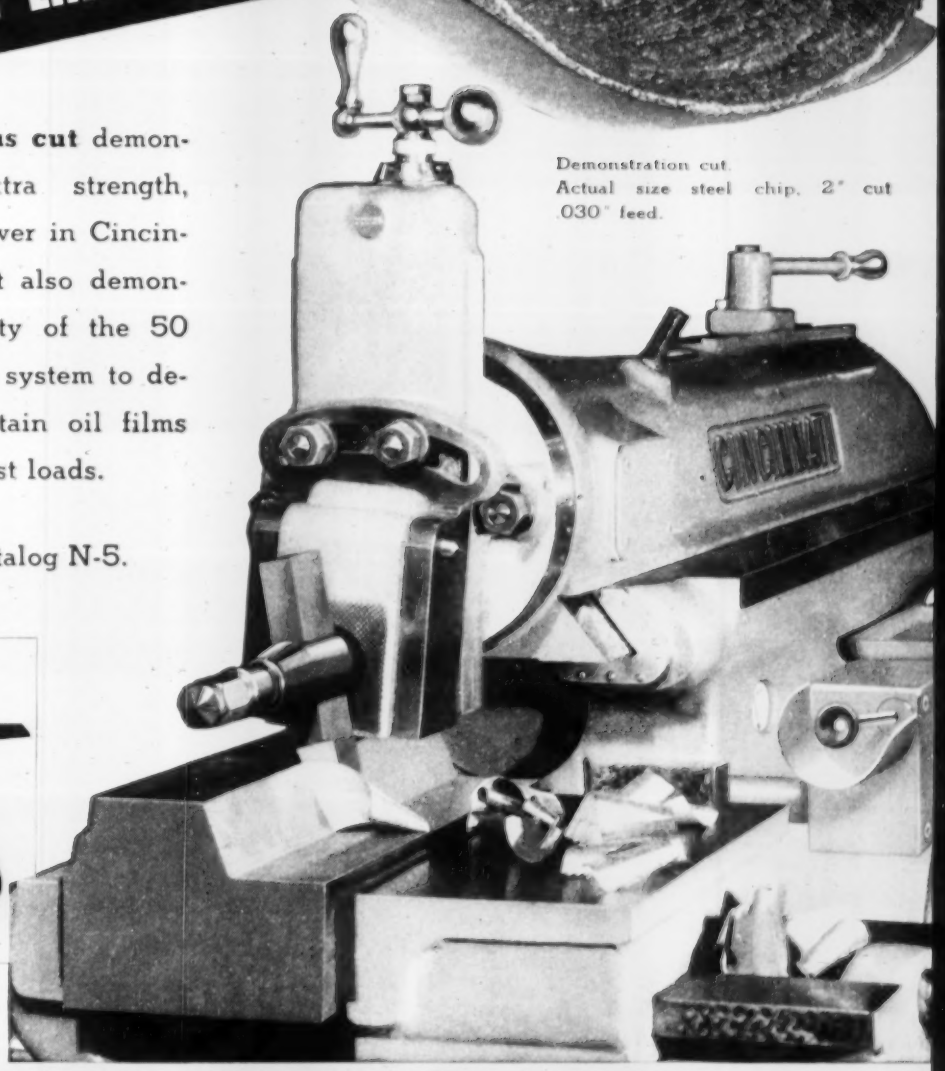
Demonstration cut.
Actual size steel chip. 2" cut .030" feed.

This tremendous cut demonstrates the extra strength, rigidity, and power in Cincinnati Shapers. It also demonstrates the ability of the 50 p.s.i. lubrication system to develop and maintain oil films under the heaviest loads.

Write for Catalog N-5.



50 p.s.i. system includes 50 micro filter, settling basin and reservoir. Transmission runs submerged in oil.



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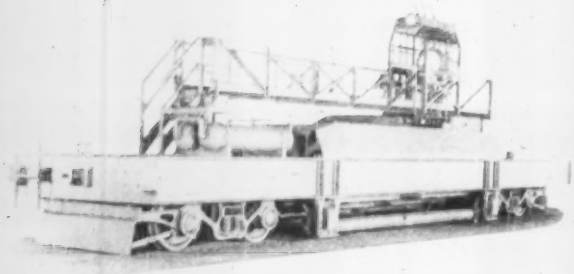
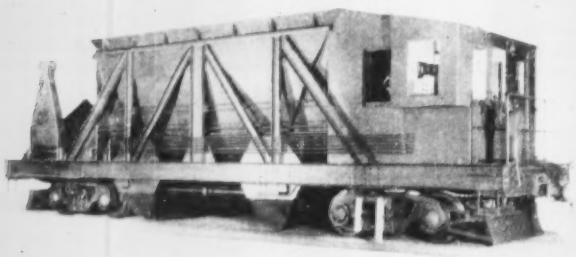


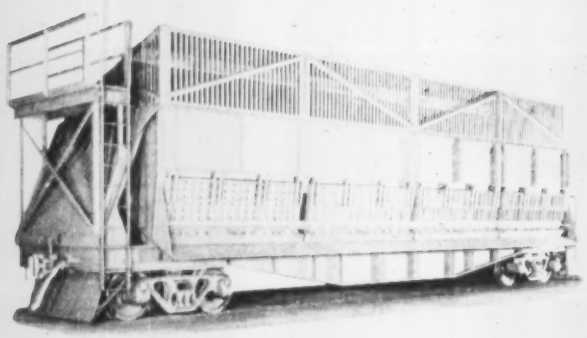
30 Ton Double Hopper Bottom Scale Charging Car. Operator's platform is above hopper to facilitate bin operation.

SCALE CARS



60 Ton Center Bottom Dump Ore Transfer Car. Equipped with pneumatically operated balanced type pusher arm.

ORE TRANSFERS



Coke Quenching Car. Motor-operated cast steel discharge gates. Bottom, ends and front are abrasive resistant steel plate.

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LETTERS
TO THE EDITORS

Hair Raising Experience

I read with great interest your "shocking story" of the plastic roof on the Ford Skyliner (Mar. 22, p. 56) in the Mirrors of Motordom. I cannot vouch for the plastic seat covers but I do know that service station attendants have mussed up the wife's hair after careful grooming by the simple expedient of cleaning the roof with a dry cloth. If you have any doubt in your mind I would be glad to give a free demonstration the next time you are through Denver. I suspect the low humidity may have something to do with it.

Arnold W. Jones Jr.
1321 Bannock St.
Denver

Sell, Sell, Sell

We have just seen your article "Now You Have To Sell" (Feb. 22, p. 91). This is timely, very interesting and well prepared. We could use 25 additional copies.

J. J. DeMarie
Manhattan Rubber Division
Raybestos-Manhattan, Inc.
Passaic, N. J.

• *Sent—Ed.*

That's Our Job

Let me say again what a splendid magazine STEEL is. The editors are doing a magnificent job of editing and furnishing data to its readers.

Melvin L. Manwarren
510 South Fillmore
Amarillo, Tex.

Featuring Fringe Benefits

The purpose of this letter is to tell you that in my remarks to the foundry industry at the 52nd annual meeting of the Steel Founders' Society of America in Chicago I referred to an article which appeared in STEEL, "Bargaining on Economic Downtrend" (Mar. 1, p. 51). The article to which I refer dealt with fringe benefits. While I know that some foundries are paying close to 45 cents per hour in fringe benefits and others not quite so much, I question whether most companies paying fringe benefits realize the extent to which the payout is not recognized by the worker. In other words, he takes it for granted.

Your article provided much good information, particularly the tabulation

(Please turn to page 12)

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SUPER-PRECISION
M-R-C has long been known for leadership in the field of Super-Precision Ball Bearings. With the opening of our Super-Precision factory in Falconer, N.Y., we are now manufacturing Instrument Bearings of Super-Precision Quality.
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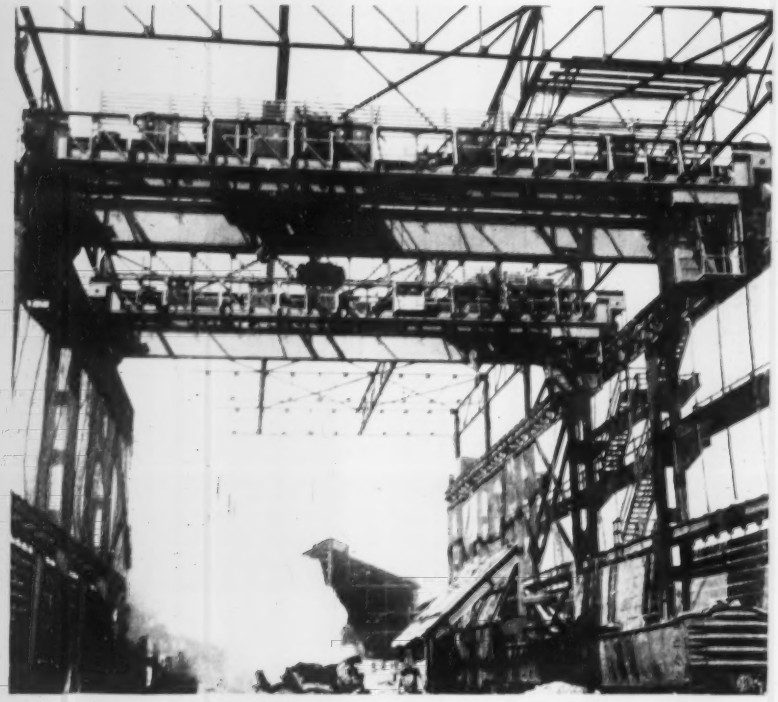
Factories:
Jamestown, N.Y.
Falconer, N.Y.
Plainville, Conn.



Two 30 ton, 75 ft. span Bedford magnet cranes with 15 ton bucket auxiliaries working over the cinder yard—used as skull crackers in Detroit Steel Company's mill at New Boston (Portsmouth), Ohio.

Bedford Cranes are individually engineered

In steel mills, power plants and throughout heavy industry, wherever superior performance is *expected*, experienced owners are enthusiastically recommending Bedford cranes.

Further proof of the superiority of Bedford cranes is found in the high percentage of *repeat orders* from important owners through the years.

Built to the most modern standards and backed by more than 52 years of specialized crane building *and utilization* experience . . . Bedford cranes have won fame the world over for advanced design and for safe, smooth, dependable performance.

Available in all types and sizes . . . from 5 tons to 350 tons, and up, for all kinds of indoor and outdoor services . . . each Bedford crane is individually engineered and precision built for its specific application.

You are invited to consult a Bedford engineer on your next crane problem . . . with all the facts on the table we believe you too will make your next crane a Bedford.

(Write for complete catalog describing Bedford Cranes in detail.)

BEDFORD CRANES SERVICE

STEEL MILL CRANES

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LETTERS

(Concluded from page 10)

which I suggested as good reading for study and comparisons by every member of the steel foundry industry.

In this office, both STEEL and *Foundry* are "must" reading. Keep up the good work.

A. J. McDonald
president
Steel Founders' Society of America
Cleveland

Artist Stretches a Graph

Disregarding for a moment all the good points in your Mar. 8 issue, you are in my opinion doing your readers a disservice by printing the type of graph used on p. 76. At least I hope you won't again allow a graph to be drawn up with equal abscissal distances representing respectively 8, 5, 14, 7, 8 and 17 years.

W. H. Bruning
1725 West Fork Rd.
Cincinnati

• *We agree.—ED.*

Time for Noise Problem

I was very much interested in your article "It's Time To Give Noise a Hearing" (Mar. 1, p. 94). We, too, have a noise problem.

Our operations as fabricators of structural members and tank work involve chipping and grinding which in themselves are real noise makers. However, our problem is: How to keep this noise out of adjacent offices. These production and engineering offices are located adjacent to the work areas and fitted with large window areas to allow a view of shop operations. The sound transmission through these windows is sometimes so high as to make conversation almost impossible. Some experiments have been made with double glass with an air space between the panes to cut down noise, but this has not been too successful.

Do you have any suggestions on this noise problem or can you direct me to any source of information on the subject.

Dan Dewsen
San Jose Steel Co., Inc.
San Jose, Calif.

• *You seem to have two problems: one is the type of noise which can't be deadened at its source and the other is how to hold down the noise with the large window area without sacrificing the window. Perhaps some of the noise can be controlled by suspending acoustical baffles from your work area ceilings. You probably would get better results by isolating individual work areas with acoustically lined cubicles. For further information, write the Acoustical Materials Association, 59 E. 55th St., New York 22.—ED.*

Here's your list of
FASTENER STOCK
Available for
IMMEDIATE SHIPMENT
as of APRIL 1, 1954

SPECIALS
PHILLIPS HEAD SCREWS
Machine Screws—Sheet Metal Screws
Thread Cutters—SEMS
INDENTED HEX HEAD SCREWS
STANDARDS AND SPECIALS
In steel, brass, and stainless

Check with us on not-listed sizes. They may be in production or completed since this listing.

CAMCAR
SCREW & MFG. CORP.
Rockford, Illinois
Telephone 5-9451
Teletype RK-8653

STOCK TIPS

A request on your letterhead will bring 64-page Standard or 28-page Aircraft Fastener Stock List monthly. Write today!

Here's your list of
FASTENER STOCK
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AIRCRAFT SCREW LIST

AN SCREWS

NAS and CT SCREWS

Check with us on not-listed sizes. They may be in production or completed since this listing.

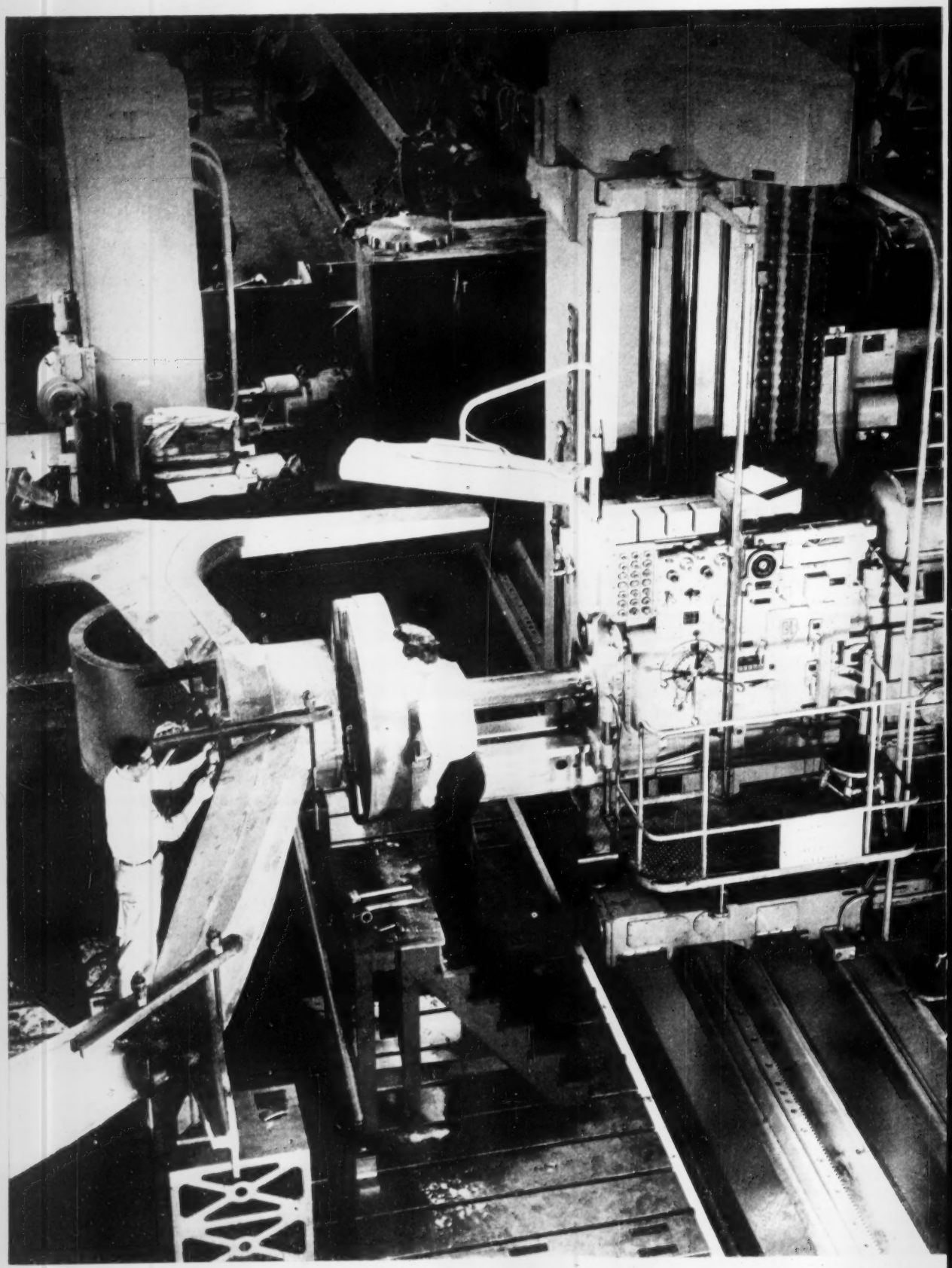


Photo courtesy of National Supply Co., Torrance, Calif., shows 50 Series Floor type machine boring and facing the stern propeller shaft bearing in the skeg casting that is now going to sea.

Machinist's mate... large economy size!

Here's a machine tool that's got everything—versatility, capacity, speed, power and precision. On it, a master machinist can do practically anything. It's a heavy-duty, G&L 50 Series Horizontal Boring, Drilling and Milling Machine

Here's a superb machine that skilled machinists dream of working with. You can bore, drill or mill with equally high efficiency no matter what the workpiece—large or small, simple or complex.

Smooth, versatile and powerful . . . it's a machine that performs multiple operations from a single setup. Extremely rigid, with over 100 speeds and an unusually wide range of feeds, a 50 Series machine completes every job. And it's built to maintain its new machine accuracy for many years to come.

Quality built to the most exacting standards, G&L 50 Series machines are available in table, floor and planer types . . . with runways, columns and tables to meet any practical requirement. For complete details, see your G&L representative or write for Catalog and Bulletin N-1.

GIDDINGS & LEWIS MACHINE TOOL CO.

FOND DU LAC, WISCONSIN

Builders of the world's most heavy-duty machine tools — Horizontal Boring, Drilling and Milling Machines — Table, floor and planer types; Hypro Double Housing and Open-side Planer; Planer Type Milling Machines; Vertical Boring Mills; and Davis Cutting Tools

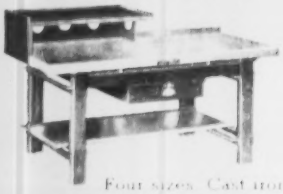
where precision counts

Specify

Challenge

For layout, inspection, checking, lapping, assembly and welding operations depend on the accuracy and stability of Challenge Precision Equipment. Mail coupon for information on Layout Surface Plates . . . Clamp Edge Layout Plates . . . Reading Tables . . . Lapping Plates . . . Welding Tables . . . Surface Plates . . . Bench Plates . . . Surface Plate Equipment.

Challenge Work Benches . . .



Four sizes. Cast iron top, two inches thick. Welded steel supports, tool box shelf, steel drawer with lock.

Challenge

TRADE MARK ®

THE CHALLENGE MACHINERY CO.
GRAND HAVEN, MICHIGAN

The Challenge Machinery Co.
Grand Haven, Michigan
Send details on checked below.

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Surface Plate Equip — Welding Tables
General Catalog

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Full address

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AIM*

for
savings in
packaging and
shipping

ACME STEEL IDEAS

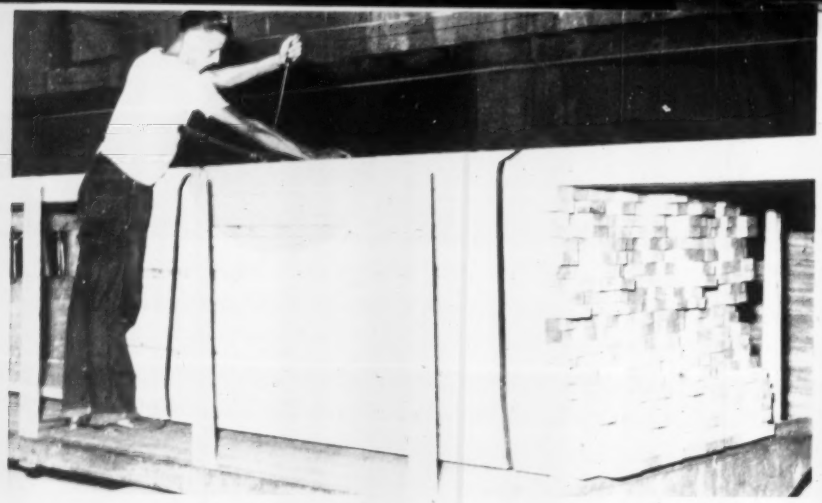
*ask your
Acme
Idea
Man
to help solve
your problems

for materials handling ideas and problem-solving ask Acme Steel first

Whether you sell or buy, you must pay for packaging and for shipping. Helping control these costs and at the same time, making sure your merchandise is packaged to arrive damage-free, is the *aim* of Acme Steel Company.

Acme Steel Strapping and Wire Stitching methods are engineered to your specific operations . . . set up by Acme Steel representatives to save costs in time, labor and materials. Ask your Acme Idea Man about steel strapping and wire stitching ideas that will uncover extra profits in your business.

ACME STEEL

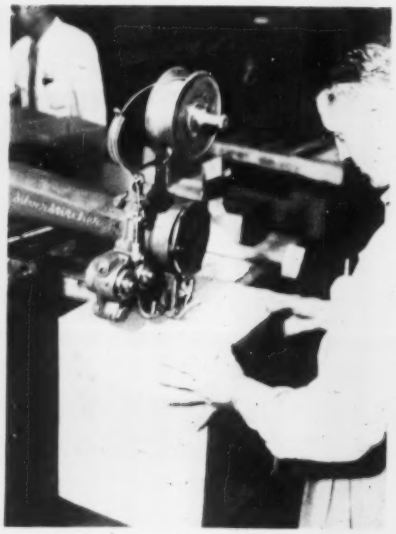


Idea #401—Home Materials Company, Mansfield, Ohio, is saving time and labor costs by bundling lumber at the yard prior to delivery. Lumber arrives undamaged and is easily inventoried when Acme Steel Unit-Load Band is used.

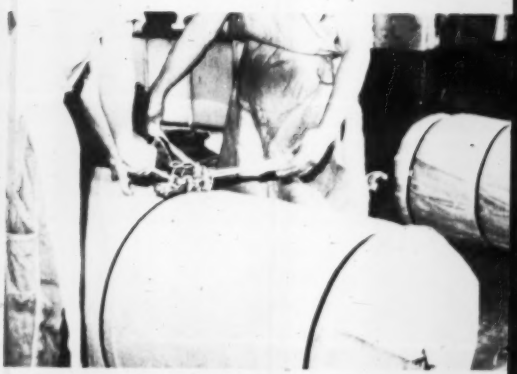
AIM → for safe, lower-cost shipping with Acme Steel Strapping and Wire Stitching ideas

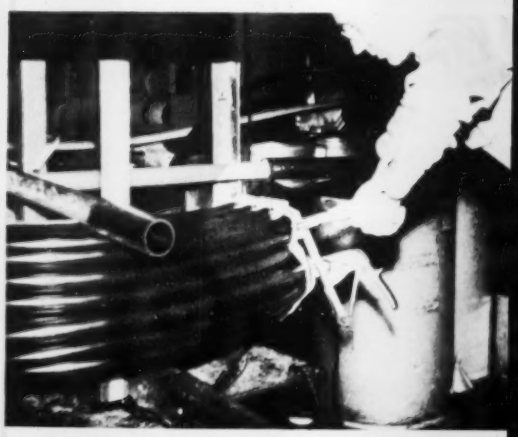
Idea #403—Acme Steel Silverstitchers and Stitching Wire have played a part in a 20% increase in packaging output and a 50% reduction in manpower at Burroughs Corporation of Detroit. Also, the company is certain its products arrive undamaged.

Idea #404—Richmond Export Services in California maintains a packaging pace that adds to profits. Time, labor and material costs were reduced in assembly of flat cartons through the use of Acme Steel Wire Stitching Machines.

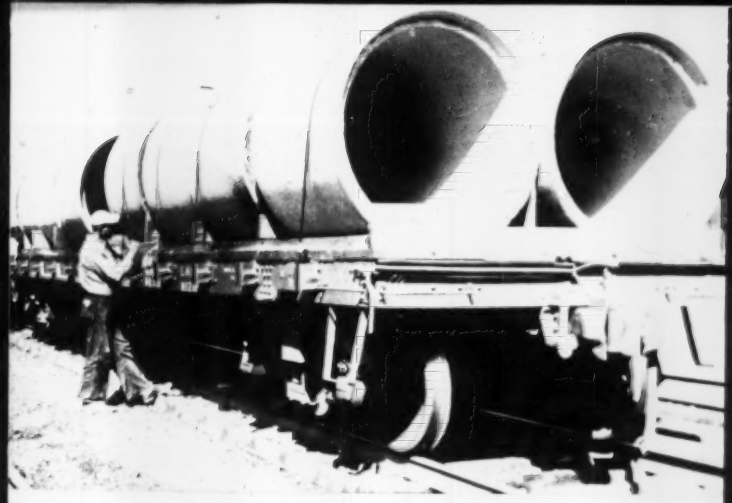


Idea #402—The fast handling and safe shipping of bulky rolls of tire cord fabric has been solved at Firestone Textiles, Gastonia, N. C. This Acme Steel Strapping idea permits ten to twelve 1300-pound rolls to be packaged an hour.

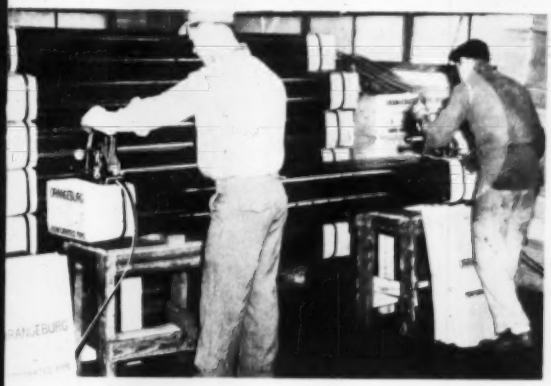


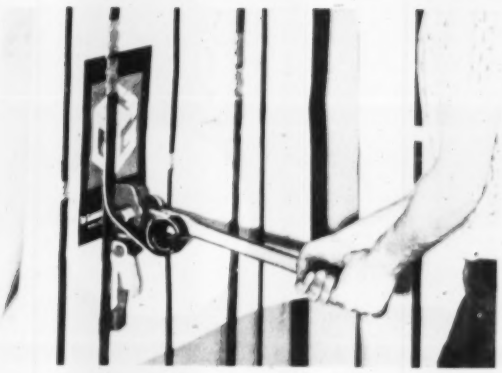


Idea #406—Plastic Process Co. Inc., Los Angeles, has saved 82% in packaging materials and 50% in time and labor costs by using Acme Steel Strapping. Packaging of 400-foot coils of pipe is no longer a major shipping headache.



Idea #405—Damage claims have been eliminated as a result of using Acme Steel Unit-Load Band at Jos. A. Likely, Ltd., St. John, New Brunswick. Today, the loading of reinforced concrete pipe has been speeded up and there is a full assurance of safe arrival.





Idea #408—Orangeburg Manufacturing Co., New York, has saved packaging and handling costs of pipe with modern Acme Steel Strapping methods. Packaging productivity was increased; handling costs at the site of installation reduced.

Idea #407—Acme Steel Strapping methods have answered a loading problem at The Gardner Board and Carton Co., Middletown, O. The "controlled floating-load" method cuts freight bills and bracing costs . . . makes loading quick, easy.

AIM *For Safe Lower-Cost Shipping*

ACME STEEL

ask your **A**cme **I**dea **M**an to apply these ideas to your shipping problems . . .

Idea #101—Skid loading empty battery boxes

Idea #102—Ring for looping strapping around large containers on conveyor lines

Idea #103—Strapping bundles of nested bakery pans

Idea #104—Palletizing and carloading wax slabs

Idea #105—Palletizing and carload bracing multi-packs of television tubes

Idea #106—Strapping coils of tire camelback

Idea #107—Carload bracing coiled copper rod

Idea #108—Skid loading cellophane rolls in cartons

Idea #109—Bundling and truck loading bee hives

Idea #110—Strapping reclaimed rubber onto skids, into palletless units, and carloads

Idea #111—Bundling solid fibre newsprint cores

Idea #112—Strapping foundry flacks into bundles

Idea #113—Strapping dies for paperboard cartons

Idea #114—Bundling a glazed combination door

Idea #115—Bundling glazed storm windows

Idea #116—Bundling glazed check-rail windows

Idea #117—Bundling glazed plain sash rail windows

Idea #118—Unitizing and skid loading Kd cartons

Idea #119—Bundling empty tin cans cuts damage

Idea #120—Skid loading empty 155 millimeter shells

Idea #121—Reinforcement of dry sand core molds

Idea #122—Carload bracing of empty cable reels

Idea #123—Self-palletized unit of concrete block

Idea #124—Strapping regular slotted containers with end flaps folded last

Idea #125—Reinforcement of crates for five-gallon water bottles

Idea #126—End stack bracing for carload shipments of case goods

Idea #127—Carloading mixed shipments of kegs and cases of beer

Idea #128—Reinforcement of wood pallets

Idea #129—Skid loading printed material

Idea #130—Bundling mounted tires for export

Idea #131—Bundling refractory brick for palletless shipment

Idea #132—Baling scrap paper

Idea #133—Tying protective wrappings to oxygen cylinders.

the Acme Idea Man

—backed by years of experience and Acme Steel packaging specialists— is your source for complete data on modern shipping methods.

Ask your Acme Idea Man to help solve your problems

The materials handling and shipping methods that are often most economical and that assure safest arrival are those which are planned at every step of manufacturing—from product design through to product delivery. This is the *aim* of your Acme Idea Man. And he is trained to analyze any or all of your shipping or packaging problems . . . make an on-the-job demonstration . . . and give you specific recommendations.

Acme Steel Company experience in problem-solving reaches into every conceivable use of steel strapping and stitching wire. This knowledge, coupled with modern Acme Steel Strapping Tools and Wire Stitching Machines, is available through the nearest Acme Idea Man. Now is the time to put him to work for you. Call him, or mail the coupon below to Acme Steel Products Division, Acme Steel Company.

ACME STEEL PRODUCTS DIVISION, Dept. GH-44
Acme Steel Company
2840 Archer Avenue, Chicago 8, Illinois

Please send me further information on Acme Steel's Safe, Lower-Cost Shipping Methods. I am interested in ☐ Steel Strapping, ☐ Wire Stitching, ☐ having an Acme Idea Man call on me.

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____

AIM FOR SAFE, LOWER-COST SHIPPING AND PACKAGING WITH ACME STEEL STRAPPING AND WIRE STITCHING IDEAS— MAIL THE COUPON TODAY!

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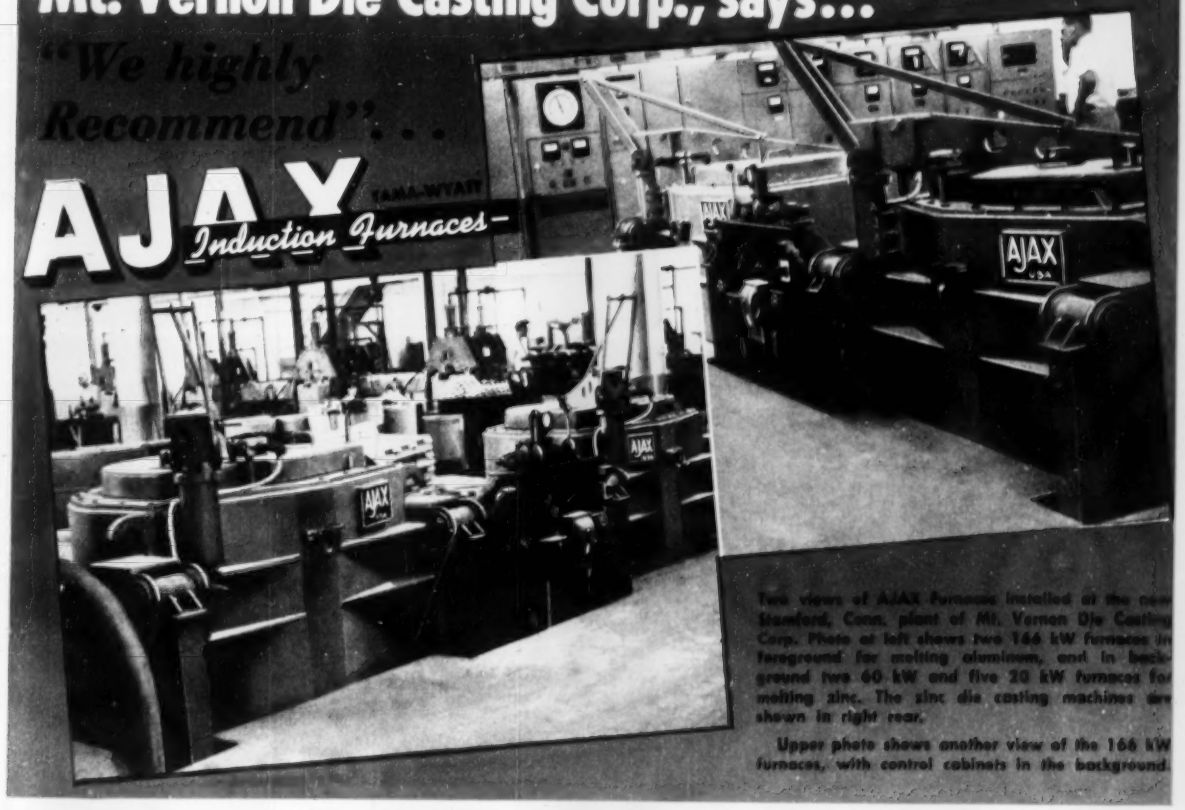
Mt. Vernon Die Casting Corp., says...

"We highly Recommend"...

AJAX TAMA-WYATT Induction Furnaces



Two views of AJAX Furnaces installed at the new Stamford, Conn. plant of Mt. Vernon Die Casting Corp. Photo at left shows two 166 kW furnaces in foreground for melting aluminum, and in background two 60 kW and five 20 kW furnaces for melting zinc. The zinc die casting machines are shown in right rear.

Upper photo shows another view of the 166 kW furnaces, with control cabinets in the background.

After a most satisfactory experience of more than five years with AJAX *low frequency* Induction Furnaces in their Mt. Vernon, New York plant, this company has now installed the furnaces shown above in their new modern plant at Stamford, Conn. "We are convinced," they state, "that economy of operation makes this type of furnace well worth while. We intend to continue to install them till all our die casting machines are fed by AJAX furnaces."

AJAX induction melting and holding furnaces are finding wide acceptance in the American die casting industry. Experience has shown that they greatly improve the overall performance. In particular, the absence of fumes and reduction of radiant heat give greater comfort to the operators. Electricity is one of the few commodities which have not increased in price in recent years.

Agitation, due to internal electrical stirring, insures uniform temperature and homogeneous mixing of the ingredients. Since linings are made of inert refractories, they cannot contaminate the melt. Temperature control is entirely automatic and keeps the molten mass within 5° F., holding the metal at the lowest feasible casting temperature.

Amazingly low maintenance is the rule. Some furnaces operate for as long as 7 years without renewal of refractory lining. Rejects and metal losses are extremely low.

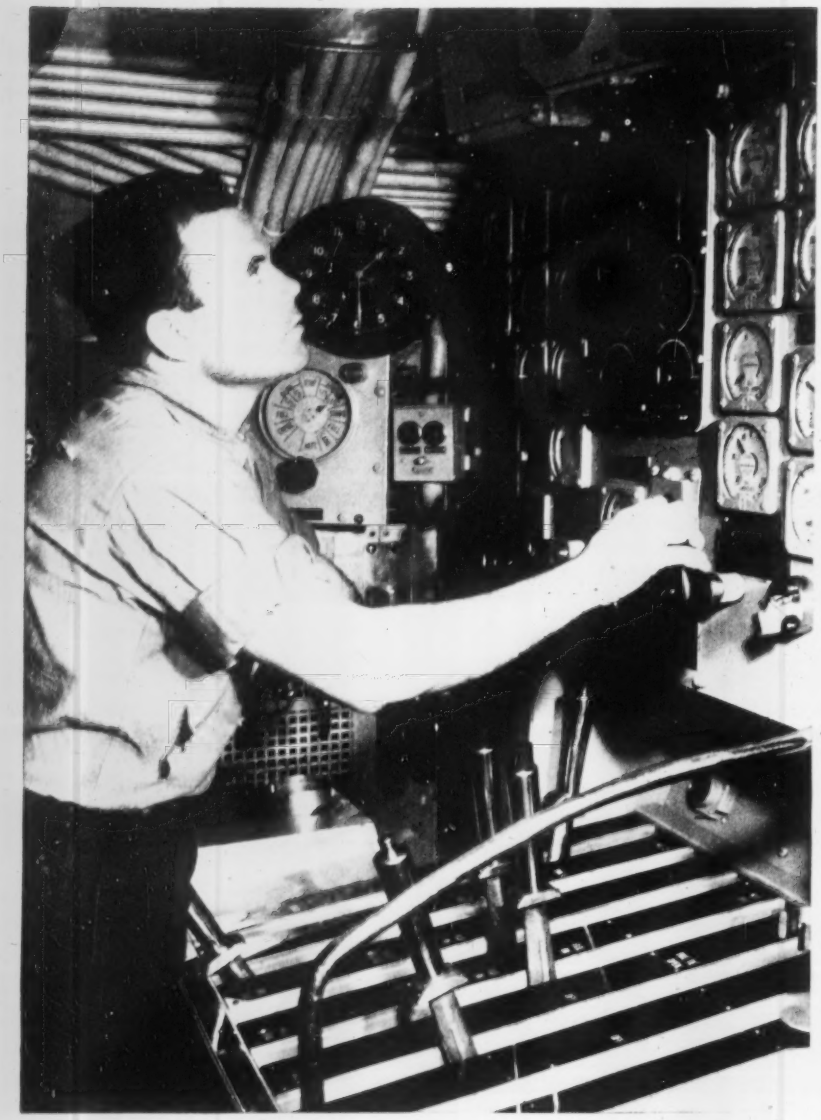
AJAX

TAMA-WYATT

AJAX ENGINEERING CORP., TRENTON 7, N. J.

INDUCTION MELTING FURNACE

AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
AJAX ELECTROTHERMIC CORP.,
AJAX ELECTRIC CO., INC.,
AJAX ELECTRIC FURNACE CORP.,



Meters tell the tale but SPECIAL ELECTRICAL ALLOYS do the work

"Steelmaker to the Electrical Industry" is a title we have earned the hard way . . . by the sweat of research and pioneering development. In this modern world of gauges and instruments, of automation, electronics and atomics, the heart of the design is so often some silicon steel, high-permeability alloy, or other special electrical material that we produce. ● When *you* need a steel to do what ordinary steels cannot do—whether electrically or in resisting corrosion, heat, wear or great stress, call on us. *Allegheny Ludlum Steel Corporation, Oliver Bldg., Pittsburgh 22, Pa.*

PIONEER in Specialloy Steels

Allegheny Ludlum

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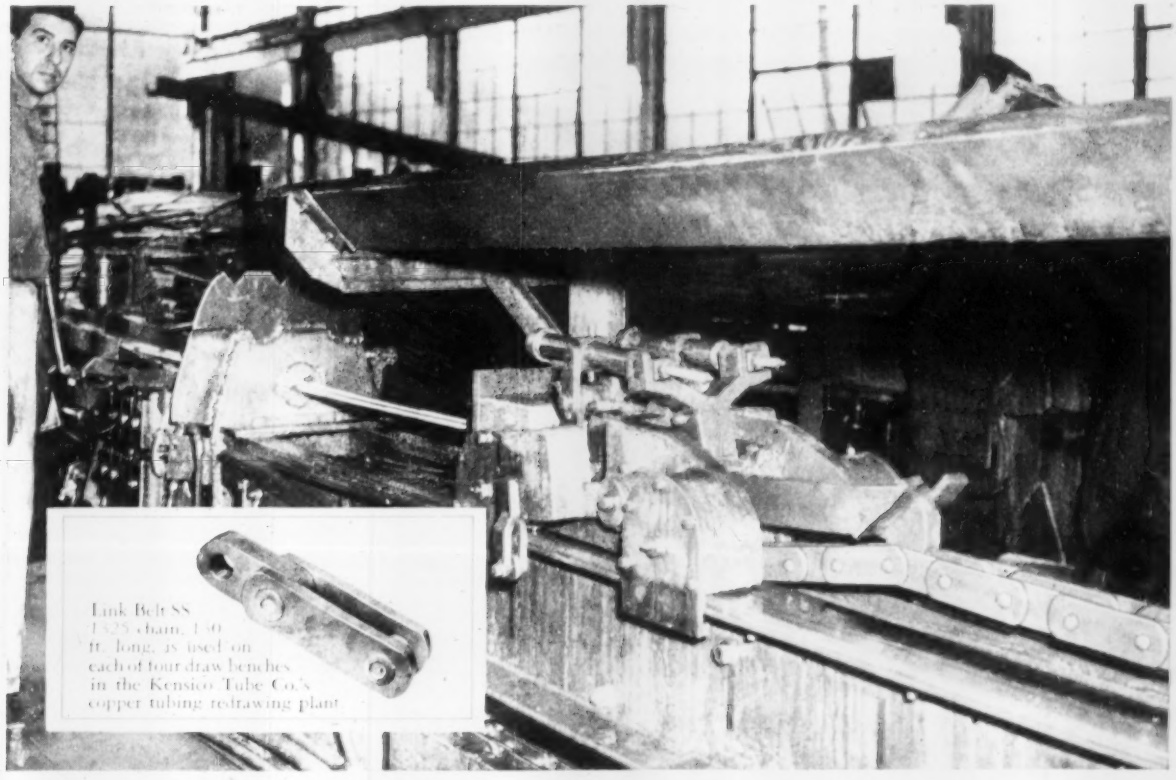
TIME-TESTED STAINLESS STEEL

Warehouse stocks of Allegheny Stainless carried by all Ryerson plants

Here's why so many of the nation's draw benches use LINK-BELT chain



Link-Belt SS 1325 chain, 150 ft. long, as used on each of four draw benches in the Kensico Tube Co.'s copper tubing redrawing plant

No ONE chain serves every purpose —get the RIGHT one from the complete line

Class H drag chain for drag conveyors, handling shavings or other refuse in runways or troughs.

Class C combination chain—popular, durable, low cost design for elevators, conveyors.

LXS chain particularly suitable for heavy-duty drive and conveying jobs.

Transfer chain with tilting dogs — for plate and slab travel; loads up to 500,000 pounds.

LINK-BELT offers the chain that's best for every job

WHETHER it's for a 5000 or a 1000000-pound bench, Link-Belt draw bench chain is built to maintain close pitch and correct sprocket contact. Links are accurately machined after hardening by a special process that assures longer chain life.

Manufacturing refinements such as these are typical of every chain in the complete Link-Belt line. Accurate control of raw materials and manufacturing processes is your assurance of uniformity.

For complete information on chains and sprockets for draw bench or any drive or conveyor service, see your Link-Belt sales representative. He can show you the *one* chain that's best for your requirements.

LINK-BELT

CHAINS and SPROCKETS

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry: Electric Arc Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York. — Canada, Scarboro (Toronto 13); Australia, Sydney; South Africa, Springs. Representatives Throughout the World.

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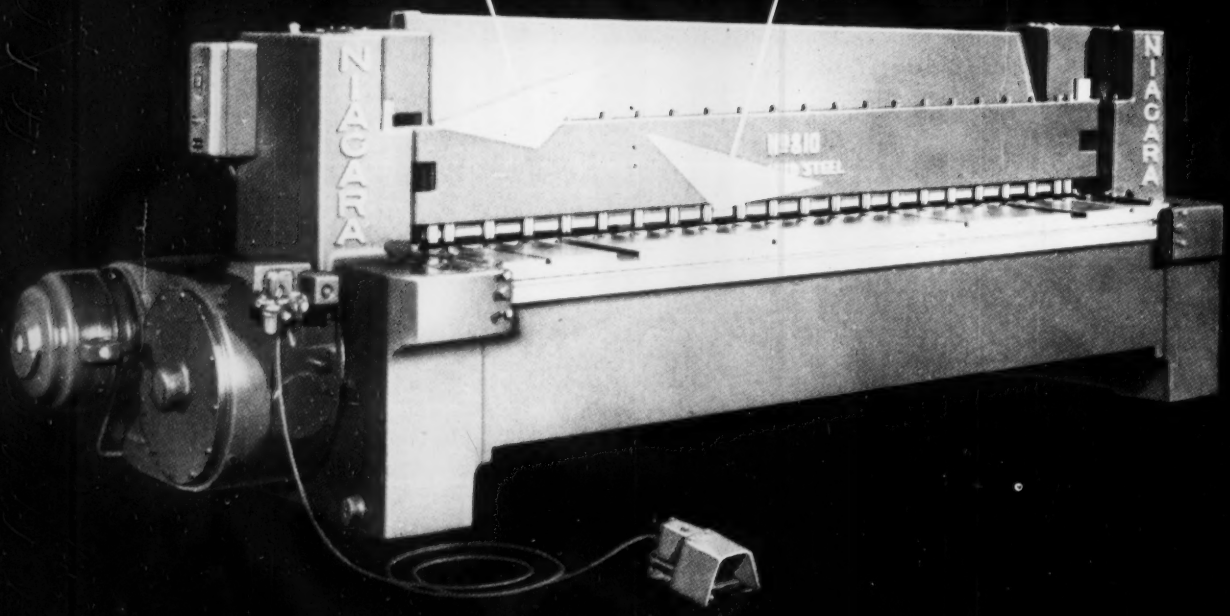

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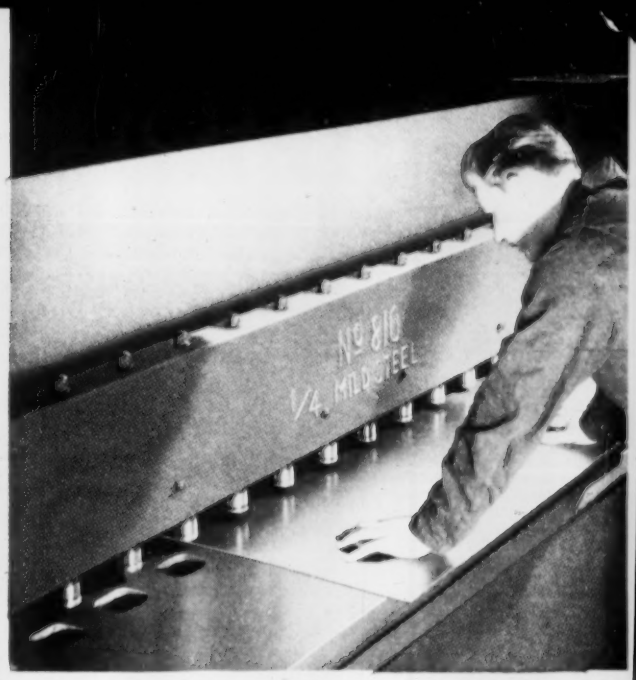
a BIG FACTOR in the superiority of Niagara Shears



"STRAIGHT-EDGE" CUTTING ACCURACY
Positive, power actuation grips work securely for maximum cutting accuracy.

LOW IMPACT AVERTS DAMAGE AND INACCURACY
Individual pressure feet contact work with low impact, thus safeguarding both the material and bed against damage, as well as reducing noise level. No hammer-blows to mar work. No peening of bed with resulting distortion of knife seat.

SIMPLIFIED, LOW UPKEEP DESIGN
Simplicity of design and construction, involving a minimum number of parts, assures negligible servicing. With *less* to go wrong, there is *less* to repair and replace.

HOLDS WORK FLAT AND STATIONARY
Multiple pressure feet on 6" centers, applying uniform pressure, hold work flat and tight against bed to assure utmost shearing accuracy. No rippling of sheet between feet as cut progresses. Firm grip on short pieces.

HANDLES STOCK OF VARYING THICKNESS
Individual feet are self-compensating, requiring no adjustment for cutting stock of different thicknesses . . . *even at the same time.*

NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N. Y.
DISTRICT OFFICES: Detroit • Cleveland • New York • Philadelphia
Dealers in principal U. S. cities and major foreign countries

In a power squaring shear, no *single* feature nor component can be fully responsible for accuracy, speed and economy. *They* result from a *combination* of features such as the self-compensating holddown; rigid, fully closed box section construction of bed and crosshead; low slope of upper knife; ample and accurately held crosshead guides; multiple point sleeve clutch —the very features that have established the marked superiority of Niagara's Underdrive Series.

For the whole story, straightforwardly presented, on America's most complete line of underdrive power squaring shears, with capacities from shim stock to 1 in. thick mild steel (lengths 3 to 20 ft.), request *Niagara Bulletin 69*. Write today.

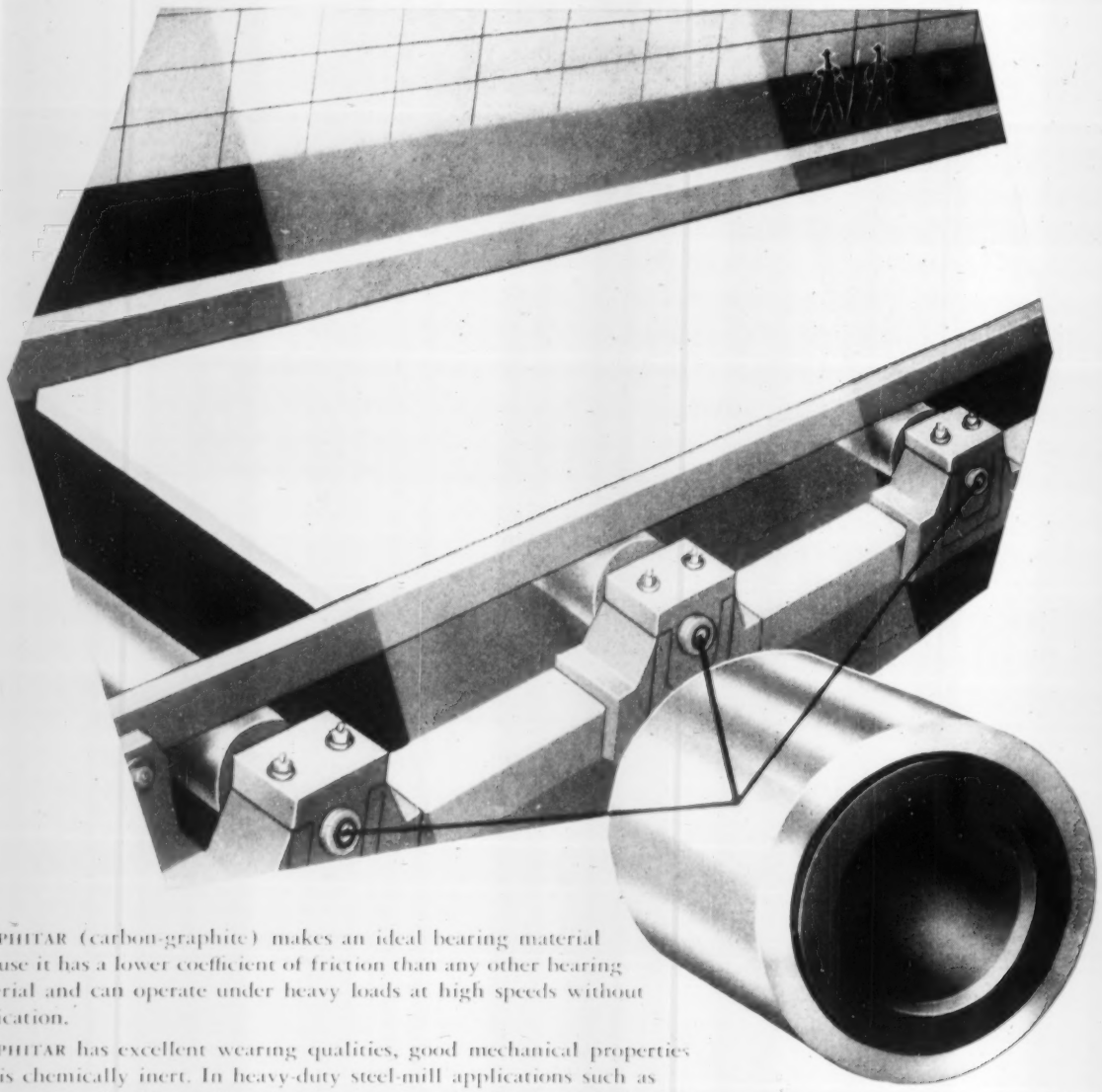
NIAGARA

UNDERDRIVE SQUARING SHEARS

GRAPHITAR®

METAL-BACKED BEARINGS FOR THE STEEL INDUSTRY

Metal-backed GRAPHITAR bearings provide exceptional strength and durability for long life in difficult steel mill applications



GRAPHITAR (carbon-graphite) makes an ideal bearing material because it has a lower coefficient of friction than any other bearing material and can operate under heavy loads at high speeds without lubrication.

GRAPHITAR has excellent wearing qualities, good mechanical properties and is chemically inert. In heavy-duty steel-mill applications such as shear or cut-off tables, coil and slab conveyors, the GRAPHITAR bearings are metal-backed to provide additional strength and resistance to shock. GRAPHITAR metal-backed bearings can be supplied in tolerances as close as .0005" ready for installation.

183

OUR 100th YEAR

THE UNITED STATES GRAPHITE COMPANY

DIVISION OF THE WICKES CORPORATION • SAGINAW, MICHIGAN

CALENDAR
OF MEETINGS

April 12, Society of Automotive Engineers: Annual aeronautic production forum. Hotel Statler, New York. Society address: 29 W. 39th St., New York 18. Secretary and general manager: John A. C. Warner.

April 12-14, American Gas Association: Sales conference on industrial and commercial gas. Edgewater Beach hotel, Chicago. Association address: 420 Lexington Ave., New York 17. Secretary: Kurwin R. Boyes.

April 13, Material Handling Institute Inc.: Spring meeting. Drake hotel, Chicago. Institute address: 814 Clark Bldg., Pittsburgh 22. Secretary: N. F. Young.

April 13-14, American Institute of Steel Construction: Annual national engineering conference. Hotel Schroeder, Milwaukee, Wis. Institute address: 101 Park Ave., New York 17. N. Y. Secretary: M. Harvey Snedley.

April 13-14, Industrial Truck Association: Spring meeting. Drake hotel, Chicago. Association address: Washington Loan & Trust Bldg., Washington 1. Secretary: William Van C. Brandt.

April 14-16, Society for Experimental Stress Analysis: Spring meeting and exhibit. Hotel Netherland Plaza, Cincinnati. Society address: P.O. Box 168, Cambridge 39, Mass. Secretary: W. M. Murray.

April 18-23, American Ceramic Society Inc.: Annual meeting. Palmer House, Chicago. Society address: 2525 N. High St., Columbus 2, O. Secretary: Charles S. Pearce.

April 20, Conference on Instrumentation in Water, Sewage and Industrial Waste Treatment, Manhattan College, sponsor. Information: Civil Engineering Dept., Manhattan College, New York 71.

April 20-21, American Zinc Institute Inc.: Annual meeting. Hotel Statler, St. Louis. Institute address: 60 E. 42nd St., New York 17. Secretary: E. V. Gent.

April 21-23, American Institute of Electrical Engineers: Annual conference on feedback control systems. Hotel Claridge, Atlantic City, N. J. Information: G. L. Stancliff, Jr., Vickers Inc., 725 15th St., NW, Washington.

April 21-23, National Screw Machine Products Association: Annual meeting. Hotel Statler, Detroit. Association address: 2860 E. 130th St., Cleveland 20. Executive secretary: Orrin B. Wernz.

April 22-23, The Wire Association: Annual regional meeting. Hotel Sheraton, Worcester, Mass. Association address: 453 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

April 22-24, American Society for Metals: Annual lower lakes regional conference. Hotel Seneca, Rochester, New York. Society address: 7301 Euclid Ave., Cleveland. Secretary: W. H. Eisenman.

April 23-24, National Association of Cost Accountants: Richmond regional conference. Hotel John Marshall, Richmond, Va. Association address: 505 Park Ave., New York 22. Secretary: S. B. Gunnerson.

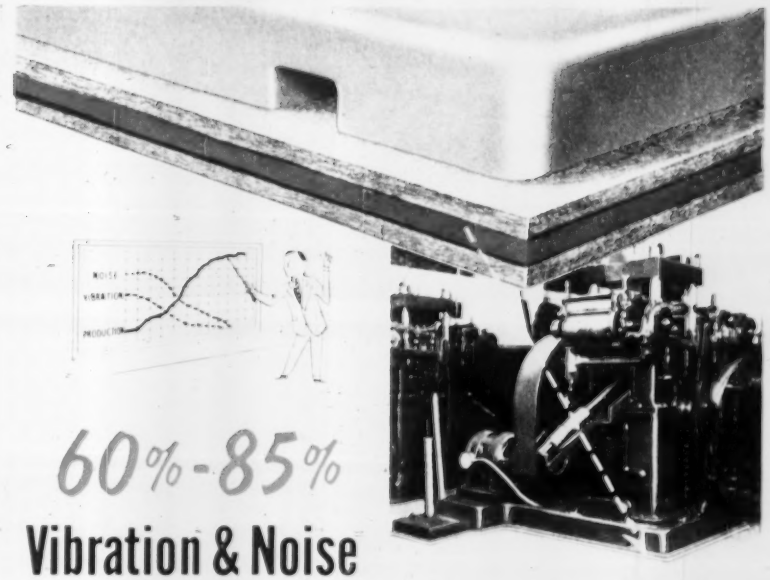
April 26-28, American Management Association: Manufacturing conference. Hotel Statler, Cleveland. Association address: 330 W. 42nd St., New York 36. Vice president-secretary: James O. Rice.

April 26-28, Metal Powder Association: Annual open meeting and exhibit. Drake hotel, Chicago. Association address: 420 Lexington Ave., New York 17. Secretary: Robert L. Zeigfeld.

April 26-30, American Society of Tool Engineers: Convention and industrial exposition. Convention Center, Philadelphia. Society address: 1700 Penobscot Bldg., Detroit 26. Executive secretary: H. E. Conrad.

April 26-30, Industrial Health Conference: Daily alternate Chicago information. Participating committee: Risk Industrial Health Conference, 205 N. La Salle St., Chicago 1.

April 28-May 1, Grinding Wheel Institute and Abrasive Grain Association: Spring meeting. The Homestead, Hot Springs, Va. Information: John Hunter, Towers Associates, 2200 Keith Bldg., Cleveland 15.



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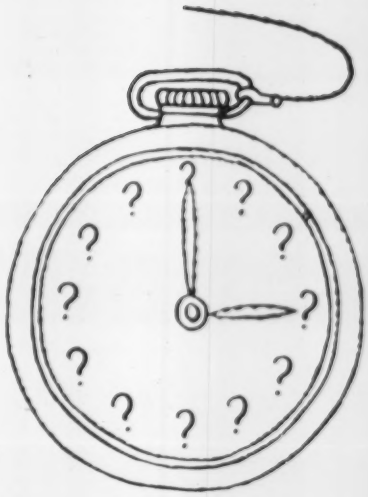

COMPARE WITH WHAT IS BEING DONE WITH A MAGNETHERMIC LOW-FREQUENCY (60-CYCLE) INDUCTION HEATER

● The Magnethermic pre-heats an 8" dia. copper or brass billet every minute. Unusual? No. This speed explains why the copper and brass industry is taking a serious look at low-frequency (60-cycle) induction heating.

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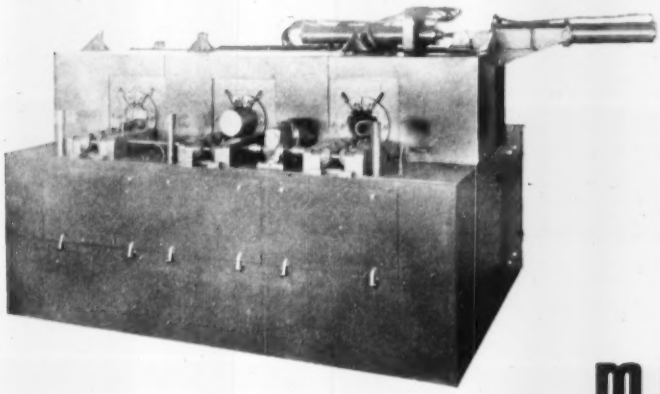
A Magnethermic does not require warm-up time, eliminating scheduling billets far in advance. Space (8' x 10' average), is many, many square feet less than conventional heating equipment. Maintenance — nothing to maintain but the heating coils and those require infrequent attention.

Magnethermic pioneered low-frequency (60-cycle) induction heating. You can obtain complete information by writing, phoning or wiring your inquiry or request to Magnethermic. Prompt reply.



3-coil Magnethermic brass billet heater rated at 8,000 pounds per hour.

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INDUCTION HEATING

● The reason for the remarkable workability of Wheeling SofTite is that it is ductile and tight coated to a most amazing degree. As a result, it forms freely and easily, with no strains on the zinc coating, no chipping or flaking of coating.

This versatile combination of a soft, ductile steel base and an incomparably tight zinc coating represents a signal achievement in sheet steel metallurgy. For not only is it manufactured by a new and revolutionary process perfected by Wheeling engineers, but it also achieves the long-sought qualities and characteristics unobtainable in the past.

Users of Wheeling SofTite Galvanized Sheets have acclaimed them the ultimate in continuously coated galvanized sheets.

Working sample available. Call or write nearest warehouse or office. Wheeling Steel Corporation, Wheeling, West Virginia.

Covered by U. S. Patent No. 2,647,068

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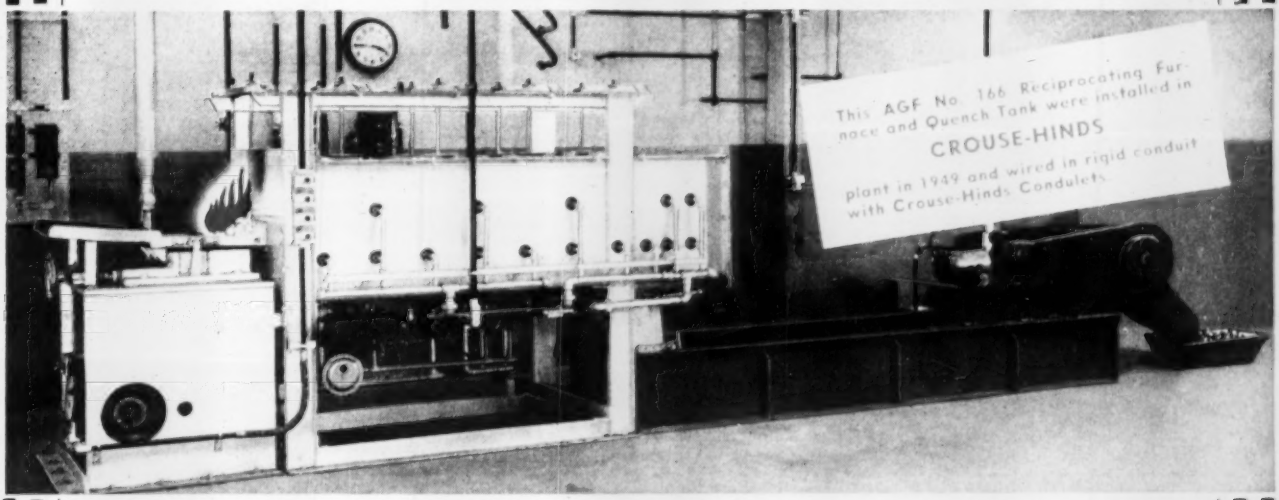
STEEL

"Improves working conditions"

says A PROMINENT INDUSTRIAL ENGINEER


This AGF No. 166 Reciprocating Furnace and Quench Tank were installed in
CROUSE-HINDS
plant in 1949 and wired in rigid conduit with Crouse-Hinds Condulets.

AFG is the PIONEER manufacturer of Pot Furnaces for salt bath hardening, but recognizes that AUTOMATIC RECIPROCATING FURNACES improve working conditions in 9 out of 10 applications.

Read This Engineer's comment—

"They call this a reciprocating controlled atmosphere furnace with quench tank and conveyor, used for carburizing and quenching clips and various other parts requiring certain hardness characteristics with high yield point, without embrittlement. The furnace is controlled within plus or minus 2½° and has been in steady use since November 1949.

"As a comparison, the operation was formerly done by heating in a salt bath in which both quantity and quality were unsatisfactory, requiring the services of an operator working under hard and undesirable conditions.

"The present operation, being fully automatic except for occasionally dumping fresh parts into the feed chute and removing a full box from the quench conveyor, gives us a product of the desired quality and quantity."

Advantages of— AGF RECIPROCATING FURNACES

- Provide better working conditions
- Nothing to do but charge
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- High production heat treating
- Hardening and quenching—one continuous automatic operation
- Dependably uniform hardening
- No messy salt to clean
- No pots to replace
- Clean hardening results
- No dangerous sputtering or splattering
- Fully sealed muffle
- Low cost of operation
- No messy salt to replace

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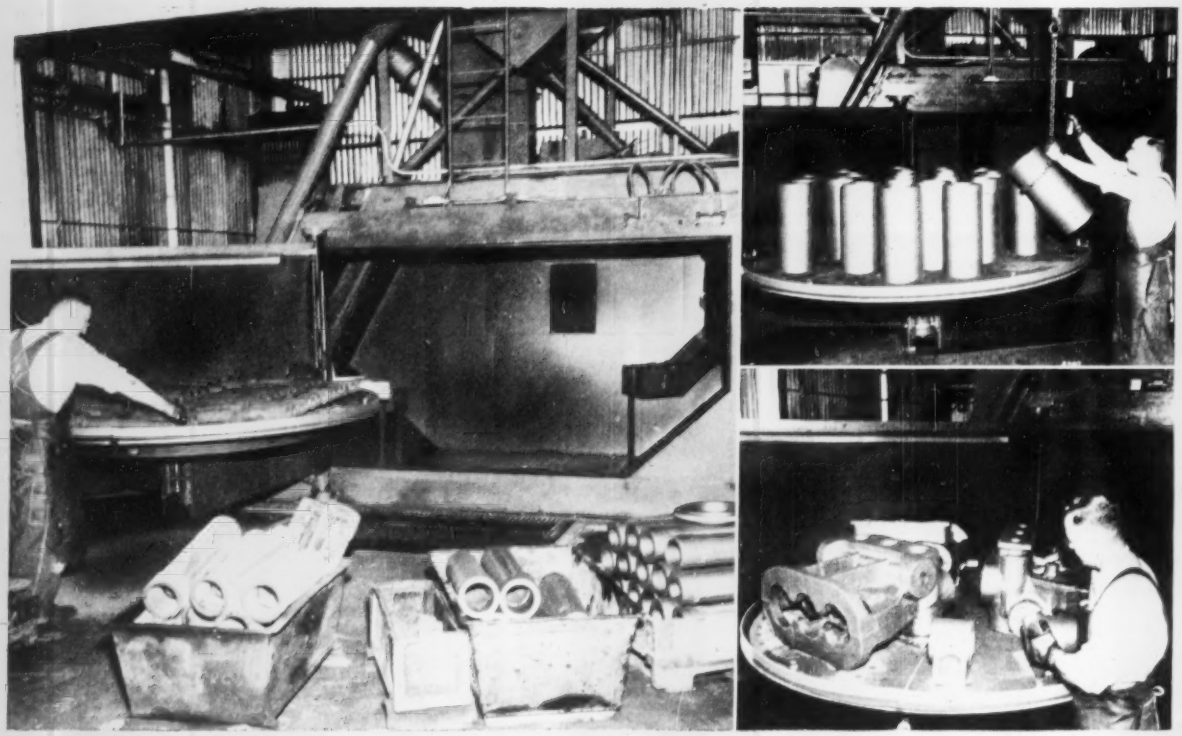
pioneering developments keep **WHEELABRATOR** ® *first in blast cleaning*



Wheelabrator Saves in Mass Cleaning of Multiple Products

One Machine Cleans Castings, Mill Steels, Heat Treated Work and Used Parts

Firms making many different sizes and types of metal products with a relatively small volume of each can profit from the experience of the Halliburton Oil Well Cementing Co., Duncan, Oklahoma. Faced with an expanding production of an increasing number of parts, they discovered that the shop-built blasting room was unable to keep pace with cleaning requirements.

The answer to their problems was the installation of an airless Wheelabrator Swing Table. Its operation has proved highly successful in cleaning work of the following types:

1. Heat treated partially machined parts.
2. Rough castings before machining.
3. Mill steels before machining, painting and plating.
4. Used parts to be repaired.

Wheelabrating has cut labor requirements in half. Only one operator is required part time to clean their entire production instead of the 2 men previously needed. Cleaning quality has materially improved with the elimination of the human factor in hand blasting.

Multiple loading and mass cleaning of this variety of parts has effected a considerable savings in cleaning costs. During the first 4 months of 1953 Halliburton cleaned a total of 653 tons of metal pieces. Of this total, 151 tons consisted of pieces weighing up to 50 lbs. each with an estimated cleaning cost of ½c per pound. The balance included parts weighing from 51 to 1250 lbs. each and was cleaned for ¼c a pound.

For complete details on Wheelabrator cleaning, send for Bulletin 74-B.

Wheelabrator Steel Shot assures lowest overall cleaning costs. Write for Bulletin No. 89-A.

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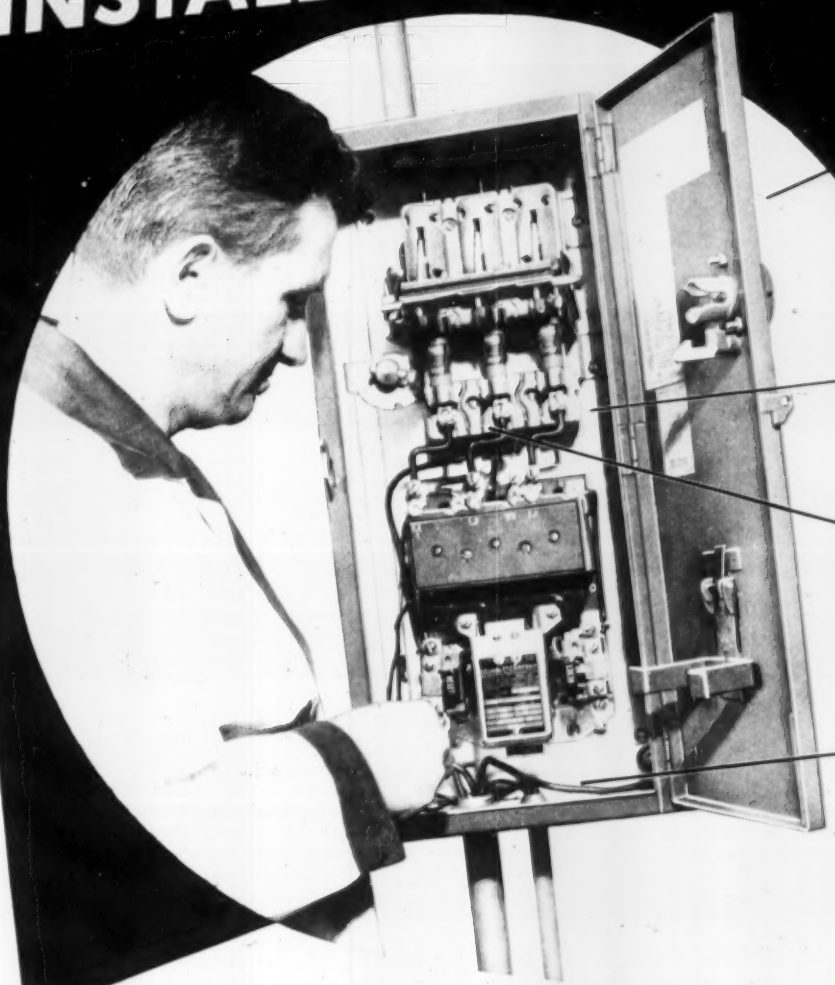
WHEELABRATOR & EQUIPMENT CORP.
509 S. Byrkit St., Mishawaka, Ind.

Wheelabrator®
AIRLESS BLAST CLEANING

EASIER TO INSTALL AND MAINTAIN!



mount *1* device instead of *2*

extra-wide gutters

all components accessible from front

plenty of knockouts

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(Switch or Circuit Breaker Types)

Save space and time. Mount and wire one device instead of two . . . neater, more attractive installations.

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SQUARE D COMPANY

Rugged packaging

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America's preferred strip steel

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Amerstrip comes in a complete range of analyses and tempers in carbon, stainless, and alloy steels . . . in coils or cut lengths . . . with a round or square, natural or rolled edge . . . in *all* commercial finishes.

If you have any question about the selection or use of strip steel, write to American Steel & Wire, Room 842, Rockefeller Building, Cleveland 13, Ohio. Our steel specialists will be glad to help you.

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UNITED STATES STEEL EXPORT COMPANY, NEW YORK

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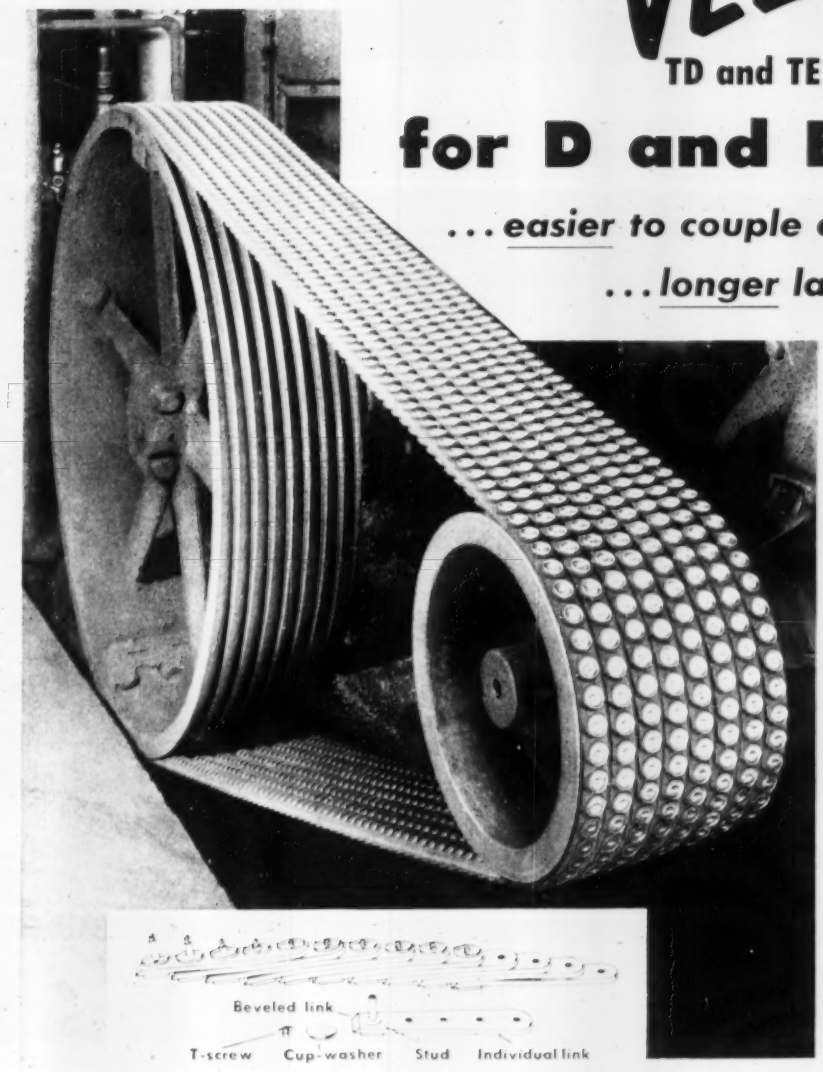
NEW VEELOS

TD and TE Adjustable V-belts

for D and E Drives

...easier to couple and uncouple

...longer lasting



This detailed line drawing of the new Veelos TD and TE v-belt makes it easy to see how this new v-belt is designed to do a better job... easier!

Now get the v-belt that's been especially developed for D and E drives—the new, patented Veelos TD and TE adjustable v-belt!

This new Veelos has advantages unmatched by any other v-belt. It is *installed quickly* without removing the outboard bearings found on most D and E drives. It is the easiest v-belt to couple and uncouple ever developed. Cup-washers and T-screws join links together to form individual belts of any length. Veelos TD and TE *lasts longer* because new high-tensile-strength links plus the new stud, cup-washer and T-screw design give *added strength* ... combines this added strength with *maximum flexibility* for cooler, smoother running.

Install this new Veelos TD and TE v-belt on your D and E drives. Prove to yourself why there's no v-belt that can match the performance, the efficiency and the economy of Veelos TD and TE.

Get the complete story of this great new v-belt for D and E drives. Send the coupon now for new 8-page illustrated catalog.

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613 Manbel St., Manheim, Pa.

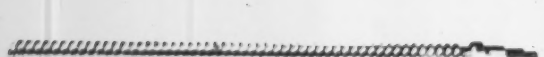
Please send copy of your new Veelos TD and TE v-belt catalog.

Name

Company

Address

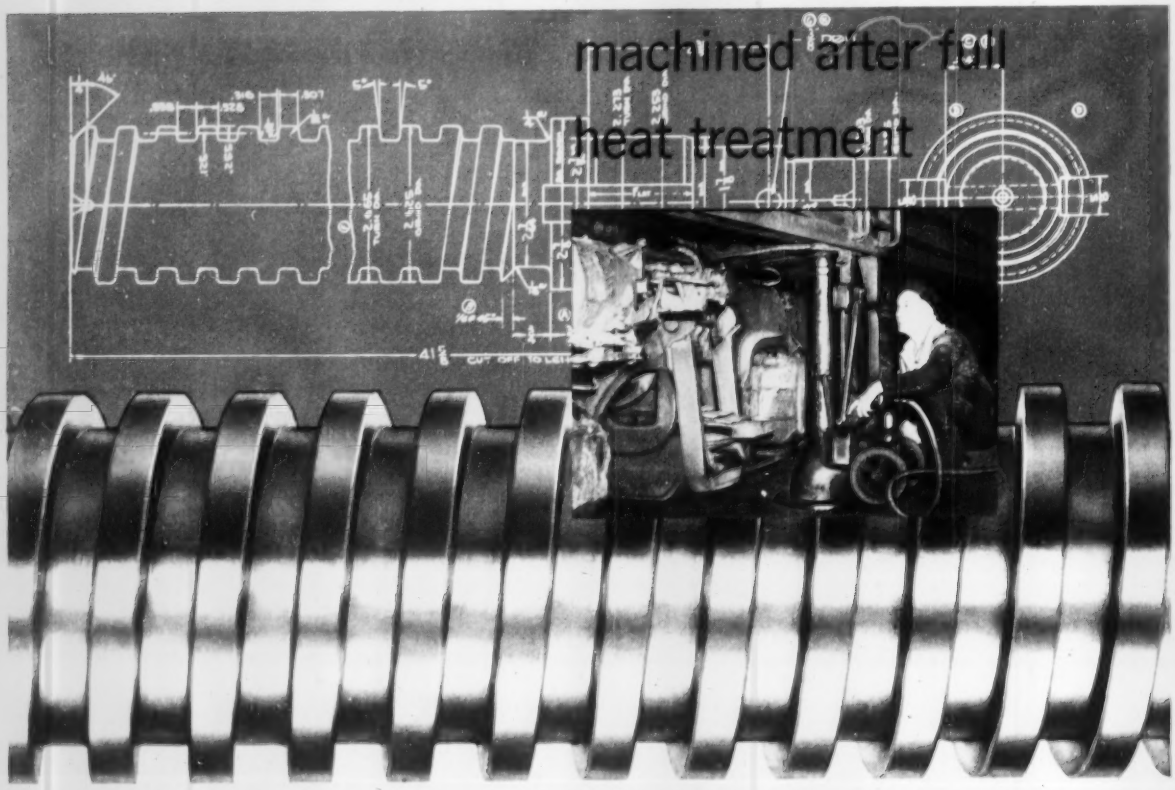
ADJUSTABLE TO ANY LENGTH • ADAPTABLE TO ANY DRIVE



MAX-EL alloy steel part

for 100-ton jack

machined after full heat treatment



The Max-el part shown above is the lifting screw from a Duff-Norton air motor screw jack. It's the part that actually lifts and holds the load . . . up to 100 tons.

To make the part, blanks are cut from Max-el 3½ bar stock. After heat treating to 321-341 Brinell, threads are chased and all machining performed. Max-el's optimum machinability after heat treatment, its high strength, toughness, deep hardenability . . . which prevents thread sinkage, and high surface finish make it an ideal choice for this rugged application.

But try Max-el yourself. Its excellent machinability means longer tool life, more pieces per grind. And you'll appreciate its freedom from distortion and superior quality. For immediate delivery of Max-el call your nearest Crucible representative.

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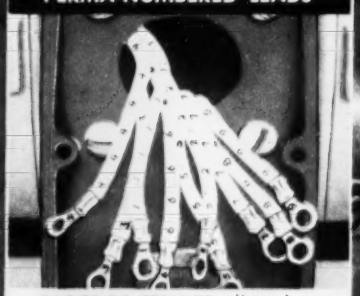
TRI 55 CLAD THE LEADER IN MODERN MOTOR DESIGN

PERMA-NUMBERED LEADS



EASIER TO SERVICE, clipped or taped terminals always can be read. You save hooking-up time.

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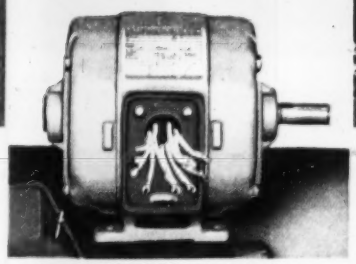
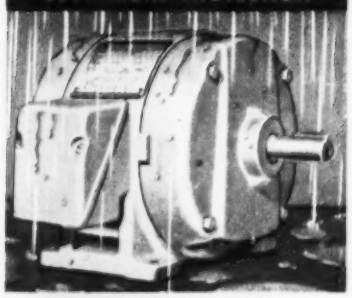


LARGE CONDUIT BOX is diagonally split, gives you ample knuckle room for easier wiring.

60% MORE PROTECTION



MORE FULLY PROTECTED motor achieved through redesign of cast iron frame and end shields.

LONGER MOTOR LIFE

NEW BEARING SYSTEM means the G-E motor runs longer without relubrication than any other.

Now, easier installation, less maintenance . . .

G.E.'s new TRI 55 CLAD motor— you can install it and forget it!

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The all-new General Electric Tri Clad "55" motor is specially engineered to reduce your installation costs . . . and run longer, without attention, than ordinary motors. This new motor gives you 60% more physical protection plus longer electrical life. In addition, a bearing system designed to use the most modern greases means you will not have to regrease the Tri Clad "55" for years.

You save with the new Tri Clad "55" because wiring is easier and faster. The large, diagonally split conduit box gives you plenty of knuckle room. Leads are perma-numbered . . . you can always identify them instantly.

The new Tri Clad "55" also brings you important handling, storing and installing economies. Better use of space within the frame means a 30% reduction in size and weight in some ratings. Yet active materials—magnetic steel and copper—are not sacrificed.

General Electric Tri Clad "55" motors are now available in many ratings. The complete line of 1 to 30 hp ac motors will be available soon. For full details contact your G-E Apparatus Sales Office or G-E Motor Supplier today. Write for Tri Clad "55" bulletins: GEA-6013—Dripproof motors, GEA-6012—Enclosed motors, GEA-6027—Gear motors. General Electric Company, Section 661-7, Schenectady 5, N. Y.

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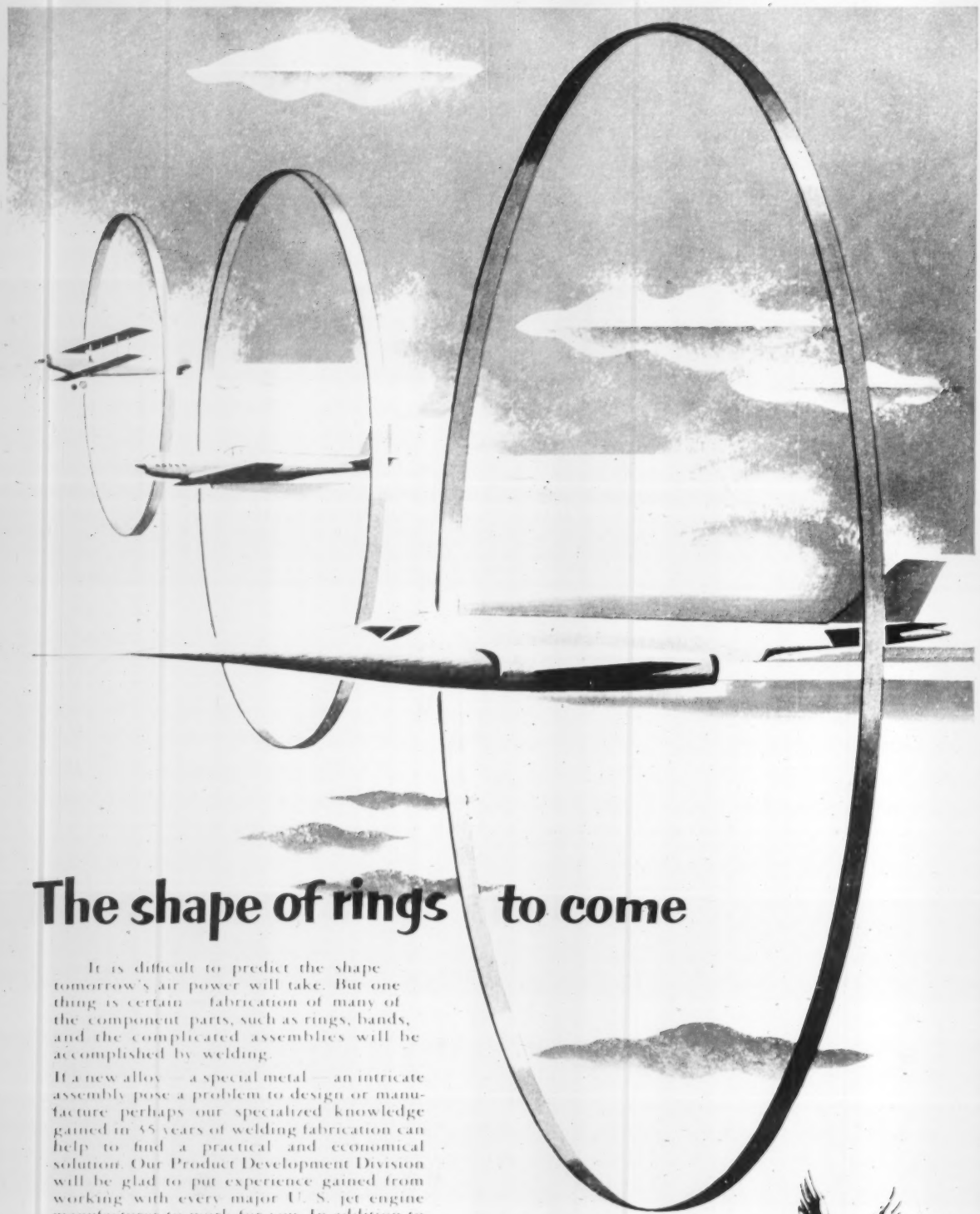

The shape of rings to come

It is difficult to predict the shape tomorrow's air power will take. But one thing is certain — fabrication of many of the component parts, such as rings, bands, and the complicated assemblies will be accomplished by welding.

If a new alloy — a special metal — an intricate assembly pose a problem to design or manufacture perhaps our specialized knowledge gained in 55 years of welding fabrication can help to find a practical and economical solution. Our Product Development Division will be glad to put experience gained from working with every major U. S. jet engine manufacturer to work for you. In addition to fusion and resistance welding of ferrous and non-ferrous metals, American Welding can provide designing, engineering, metallurgical and machining facilities.

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STEEL

April 12, 1954

Metalworking Outlook

A Better Second Quarter?

Consensus of three polls is that second-quarter business will be slightly better than the first. National Industrial Conference Board, National Association of Purchasing Agents and the *New York Herald Tribune* quizzed executives and found moderate optimism. Inventory declines are continuing, but at a reduced rate. Many businessmen see midyear as the time for a more dramatic upturn. Strong points are record construction outlays, high new equipment expenditures and a marked pickup in such industries as farm equipment which went through the wringer in 1953.

Construction Pacesetter

If the sensational first-quarter construction pace continues, a record $36.1 billion will be spent on building in 1954. That's well above the $31 billion forecast for this year. Private housing, public-utility construction and heavy highway work led the way to a $7.3-billion first quarter. Road building, incidentally, promises to continue strong for years. The Senate has voted $1 billion a year for fiscal 1956 and 1957, and the House has authorized $875 million. A measure acceptable to both branches may split the difference.

The Labor Season

Labor parleys in the electrical and steel industries will be the most important this year. Westinghouse Electric Corp. and the CIO's electrical workers have begun already, and contract talks between the basic steel industry and the CIO's steelworkers will begin in late May. The United Steelworkers' policy committee meets May 6-7 to approve demands relating to the whole contract, which expires June 30. The electrical workers want Westinghouse to finance an annual wage plan with a fund equal to 5 per cent of the payroll. Now that the steelworkers claim 200,000 members are idled by cutbacks, they are more certain than ever to make a big issue of their demand for supplementary unemployment compensation.

T-H: Big Changes Unlikely

The Senate and House Taft-Hartley revision bills are shaping up as radically different. The former measure, to be debated the week of Apr. 26, is double-talking, wishy-washy. The lower house probably won't get to its legislation until after the Easter recess, but it promises to be much stronger than the Senate version, with states' rights in labor disputes clearly defined and the National Labor Relations Board stripped of some of its power. The problem will be to reconcile the two versions. That's why substantial T-H change this year is unlikely.

Defense Business: Still High

The $1.1 billion earmarked for the Indo-China war in fiscal 1955 means continued high defense business for metalworking, although it will be down somewhat. A STEEL check indicates that most defense contractors

The Technical Outlook p. 97 The Market Outlook p. 145

except those primarily in aircraft work, foresee 15-20 per cent less government work in 1954 than in 1953. The aircraft industry expects a moderate increase in defense jobs.

Industry Gets the Initiative

The government is finally recognizing industry's potential for cutting costs in packaging. It's prescribing performance specifications instead of specs telling the manufacturer exactly how to package the product. Allowing the contractor latitude to explore the field for new and cheaper materials promises to reduce overpackaging.

A Boost for Middle Management

Middle-management executives are getting more attention, financially speaking, from their bosses, says American Management Association. Nearly half of 1300 such executives surveyed have received salary increases since last July. Those gains represent an over-all average pay rise of about 3.8 per cent. Manufacturing, engineering and marketing men, in that order, fared slightly better than the average.

More Titanium Producers?

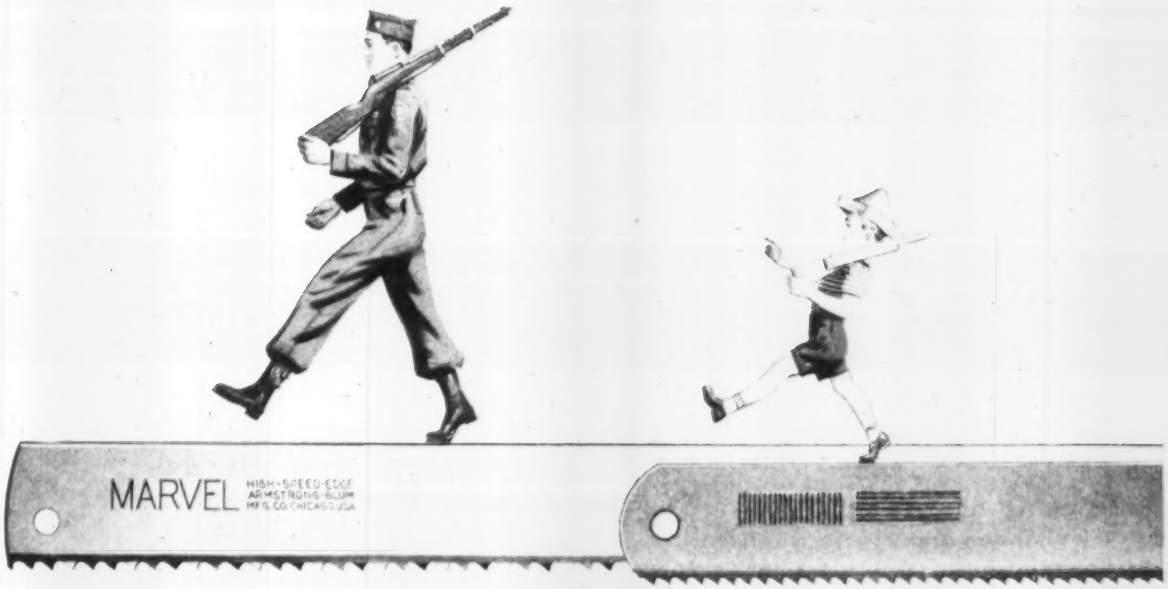
Facilities for producing an added 19,000 tons of titanium yearly may be built by Electro Metallurgical Co. (10,000 tons), E. I. du Pont de Nemours & Co. (7200 tons) and Dow Chemical Co. (1800 tons). The deals, which would boost annual capacity to 32,000 tons, await Office of Defense Mobilization approval. A number of other proposals are under study with Monsanto Chemical Co., Kennecott Copper Corp., Horizons Ltd. and Titanium Metals Corp.

Straws in the Wind

Atomic Energy Commission authorized three more companies—American Machine & Foundry Co., Babcock & Wilcox Co. and Bendix Aviation Corp.—to study the practical application of atomic power; that brings to 11 the private firms or groups now taking part in atomic research . . . Ebasco Services Inc. has given up on the New England steel mill plan, and the project seems doomed . . . Federal Trade Commission Chairman Edward F. Howrey is pushing a drive for more understandable English in FTC findings and reports . . . Midvale Co. seeks a way to get more civilian business; officials consider selling the company, merging it or acquiring a smaller subsidiary . . . Chase Copper & Brass is expanding its warehousing service to include stainless steels.

This Week in Metalworking

Twenty big companies are optimistic about 1954 (p. 47) . . . There's a buyers' market in packaging materials, too (p. 49) . . . Want to lease? For how to go about it, see p. 50 . . . There are serious bugs in the House-passed Internal Revenue bill (p. 52) . . . Used machinery dealers and users will be hard hit by depreciation provisions in the proposed new tax law (p. 53) . . . Plastic pipe producers see even higher production in 1954 (p. 54) . . . Move cautiously if you plan to shift your plant or open new facilities (p. 55).



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Kremlin's Achilles' Heel

Shortly after an H-bomb had been set off at Bikini on Mar. 1, reports were circulated that it was far more powerful than scientists had expected it to be. Japanese fishermen suffered burns and several hundred islanders were exposed unexpectedly to radiation. As the days passed, critical comment from widespread quarters throughout the world mounted.

Sensitive to this international anxiety, President Eisenhower invited Adm. Lewis L. Strauss, chairman of the Atomic Energy Commission, who had just returned from the Pacific proving grounds, to attend his press conference on Wednesday, Mar. 31. Admiral Strauss described the unbelievable power of the Mar. 1 blast at Bikini. Within minutes persons all over the world knew that man now has the means to wipe out any metropolitan area. Reaction to the Strauss disclosures was such that the administration decided to release immediately films of a Nov. 2, 1952, H-blast at Eniwetok, which originally had been scheduled for release a week later.

The combination of the Strauss remarks and the showing of the Eniwetok film aroused such new interest and apprehension throughout the world that President Eisenhower decided to talk to the people Monday evening, Apr. 5, about the implications of the H-bomb in regard to our nation's future.

Some of the "strengths" he attributed to our side are extremely important. For instance, he stressed the spiritual strength, which comes from individual rights. The Soviets have nothing to match it. He also emphasized our economic strength, and of course Russia has a long way to go to equal it.

As to "weaknesses," the Kremlin has one which President Eisenhower, as an experienced military man, is qualified to assess accurately. "The Russians," he said, "have a system of satellites, captive satellites . . . . That system could be, in a war of exhaustion, a very great source of weakness."

This is a manifestly gross understatement of a very great flaw in the Russian plan for world domination. The greater the control by the Kremlin of unwilling satellites by force, the greater will be the disintegration of Russian military prowess. Here is the real Achilles' heel of the men in the Kremlin!

E. L. Shaner

EDITOR-IN-CHIEF

AUTOMATION—HOW FAR? No. 3 in this publication's series of articles on problems of management deals with the timely and almost glamorous subject of automation. Although automation means different things to different people, it is safe to accept the rather

broad, general definition that it is the automatic processing of any product in procedures, production, handling and distribution.

Naturally almost every company in the metalworking industry is wondering whether or not it can employ automation to advantage. In preparing the exhaustive eight-page article on this subject (pp. 87-94), the editors have kept this question very much in the foreground. After thoroughly canvassing many angles of the possible expansion and application of automation, the editors come very definitely to the conclusion that for the great majority of metalworking executives, the practical question is not "should you adopt automation in your manufacturing operations?" Instead, the real question is "to what extent shall we embrace automation?"

NOT FOR GIANTS ONLY: One factor which may retard progress in automation is the prevalent idea that this advanced method of manufacturing is something that can be adopted advantageously only by the giants of industry. Much of the current publicity in regard to automation refers to achievements in the engine plant of Ford Motor Co. in Cleveland, the ordnance plant in Rockford, Ill., and the Ford stamping plant in Buffalo. These are, indeed, big scale operations.

However, automation can be practiced advantageously on a modest scale. Long before automation was introduced into the metalworking industries, it was functioning effectively in food processing, bottling, canning and in some chemical plants. In some of these industries automation is not a large-scale or expensive operation. Automation is relatively new in metalworking largely because until recently orthodox methods of manufacture seemed to meet the challenge of higher wages.

Now automation knocks at industry's door because it has the answer to varied manufacturing problems.

RECORD STEEL SALES: When STEEL's editors completed their 29th annual financial analysis of the American iron and steel industry (insert facing p. 54) they came up with the information that while new records in sales and in production were established in 1953, earnings were second to those of the industry's best profit year, 1950.

Sales in 1953 exceeded $13 billion. The previous record had been $11.8 billion in 1951. Figures of 1952 have little value in comparisons because of the losses resulting from the strike in that year. Net profit in 1953 was $745 million, compared with almost $767 million in 1950 the industry's best year.

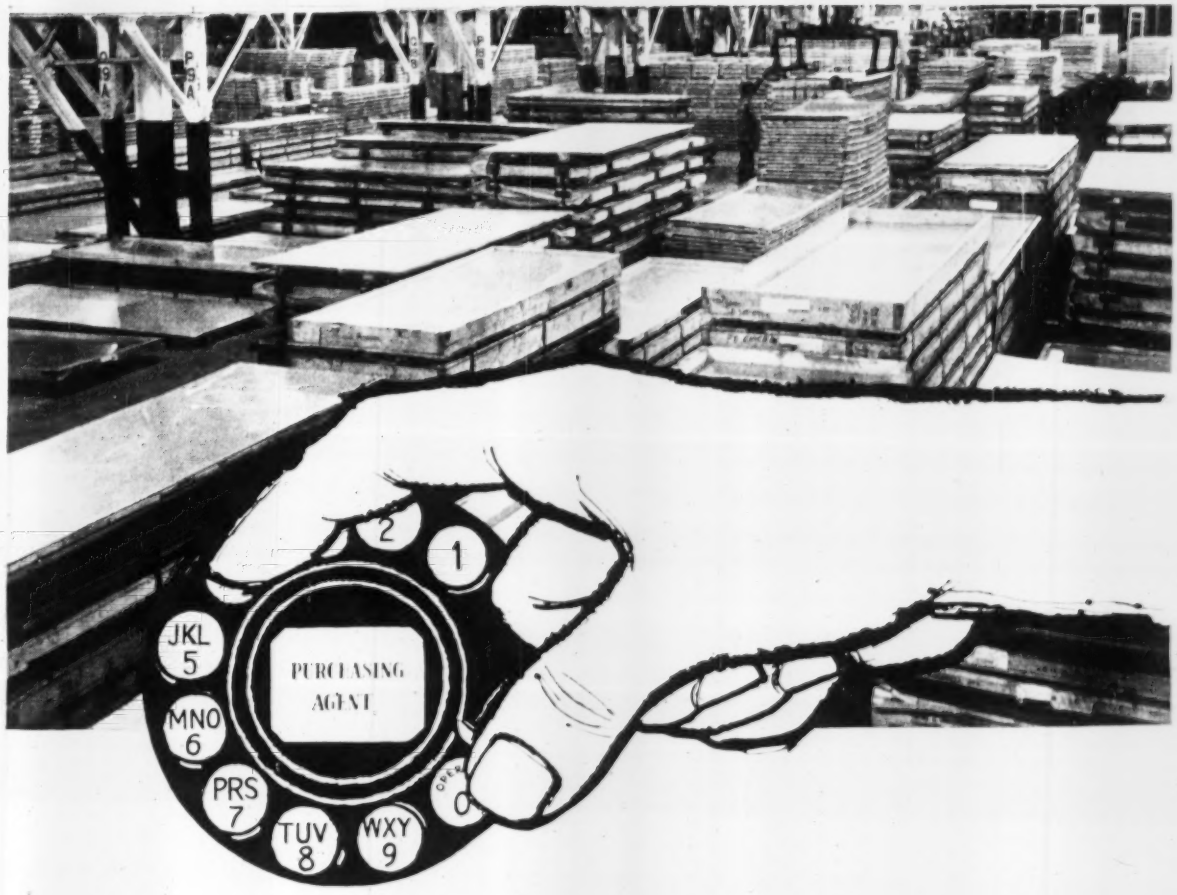
In the foregoing we have been dealing with the performance of 31 companies representing 93.4 per cent of the nation's steel ingot capacity. In toto, the industry's earnings in 1953 were less than in 1950, but some companies earned more in 1953 than in 1950. Please check the detailed tabulation for these exceptions.

ACCENT IS ON "WHERE?" Recently persons experienced in designating favorable locations for new industrial plants expressed their views at a meeting of the American Industrial Development Council in Washington. Most of the speakers cautioned industrial corporation executives to proceed very carefully when they are considering the removal of a plant from a congested or outmoded area to a spot in the suburbs or into rural territory.

Most trustworthy industrial real estate experts (p. 55) discount the so-called advantages that are proffered by chambers of commerce and citizens' groups in the form of free rent or tax remissions. In some specific cases these may be important, but in general they do not measure up to the other important considerations which determine where a new plant shall be located. We really need much more scientific data on industrial plant location.

BARRIERS TO TRADE: In response to a congressional demand for a survey to show the nature and magnitude of impediments to the investment of private American funds in foreign countries, the Department of Commerce has brought out a book entitled "Factors Limiting U. S. Investment Abroad" (p. 56), which is a surprisingly candid appraisal of pitfalls which are encountered in some 30 foreign countries.

In many instances the irritations which bedevil Americans attempting to do business abroad are caused by local regulations, habits or traits. However, the trouble does not always arise from local conditions. The book shows that not all United States investors fare alike in the same country. Some prosper where others fail, probably indicating that there are many Americans who have much to learn about foreign trade. The book should be of considerable assistance to investors.



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Annual Report--for 1954

A survey of 20 large companies reveals strong optimism for 1954 despite the indifferent first quarter. Heavy investments in expansion and research continue

HOW DO the pacesetters in American industry view the economic future?

Because of the business pessimism in some quarters, STEEL went to 20 large companies for their opinions. These firms have to be objective about their forecasting because if they are wrong they can lose billions in poorly timed expansions, inadequate product development or blind-alley research. Here's a summary of what they're thinking and doing about the future.

Allis-Chalmers Mfg. Co. points to the proverb which says: "There is a time to fish and there is a time to mend nets." President W. A. Roberts thinks 1954 is the time to do both—aggressive selling, extensive product development and organizational streamlining.

American Can Co. President William C. Stolk "looks forward with confidence" to 1954 because of his company's increased efficiency, technological improvements and fully adequate supplies of materials this year. He thinks the competitive situation is now such that any marked rise in costs, as in wage gains, will have to be absorbed at least partially by the company.

Like most of the rest of the aircraft industry, **Boeing Airplane Co.** expects 1954 sales volume to exceed 1953 levels. It had a $2.4-billion order backlog as of Jan. 1. The company has $3.2 million in authorized capital expansion projects still to be completed and expects more to come along, particularly because of rapid progress in guided missiles. Since Jan. 1, 1941, Boeing has plowed back 70 per cent of its net earnings into the business.

Caterpillar Tractor Co. says much of its 1954 sales performance will depend on its product and service reputation. It sees its biggest business coming from replacements and from the natural growth of existing markets. It looks for a

slightly lower volume in 1954 than in 1953, but profits should remain about the same.

Chrysler Corp. looks to organizational changes to improve its competitive position in 1954. It plans a divisionalized structure of semiautonomous profit centers to provide a better framework of development. Says President L. L. Colbert: "I believe industry can be

competitive without going to lower levels of economic activity."

Clark Equipment Co.'s President George Spatta believes that "proper cost controls, plus the elimination of the excess profits tax and good prospects for the sale of our newly developed line of products, will permit us to have profitable operations in 1954."

Detroit Edison Co. plans to double its present capacity to generate power within ten years. It foresees ever increasing demands from its domestic, commercial and industrial—especially industrial—customers. Within a decade some of the power it generates may come from nuclear sources because it's heavily involved in that development.

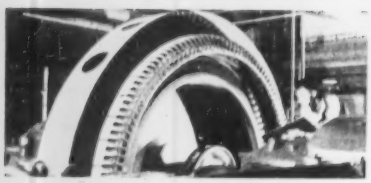
Dravo Corp. foresees 1954 as a period requiring close bidding on engineering and construction jobs.

Dresser Industries Inc., maker of oil, gas and chemical equipment, predicts a 1954 on par with 1953 because of continuing high capital expansion and improvements in the fields it serves.

E. I. du Pont de Nemours & Co.'s

President Crawford H. Greenewalt says: "The business community must accept major responsibility for seeing that panic does not start. Industry must keep its eye firmly fixed upon the long-term upward trend, the amazing and dynamic progress shown in this country over many years. To look to the future," DuPont plans even more vigorous research in 1954 than in 1953 when $57 million was put on the line.

General Electric Co. expects total sales in 1954 to be down slightly from 1953, but it anticipates better earnings this year than last. Its defense business in 1953 was more than 30 per cent of its total volume. Over the next several years, officials predict, war work will stabilize at about 20 per cent of the total. Since defense business is less profitable than civilian, the company believes that



that factor and lower federal taxes will improve 1954 earnings.

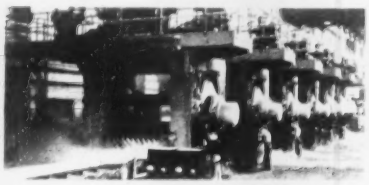
General Motors Corp.'s plans to spend a record $1 billion on expansion in 1954 and 1955 testify to its confidence in the future. Says President Harlow H. Curtice: "If those who persist in taking a pessimistic view of the future succeed in planting fear in the minds of the public, those seeds of fear could take root and the result might be the very condition we seek to avoid."

International Nickel Co. Ltd. "expects to operate at full capacity and to sell all the nickel we produce in 1954." Inco believes that its long-term developmental activities are paying off, and it's moving to keep up this work.

The increased impact of automation will be a boon to **Minneapolis-Honeywell Regulator Co.** in 1954. Its aeronautical backlogs are as high now as a year ago. Honeywell stresses the importance of being in at the beginning of big industrial development trends, such as automation and electronics.

National Cash Register Co. sees as a major market office machinery to simplify the job now being done by 8 million clerical workers in the U. S. Also, the trend toward the giant super markets will support demand for its cash registers.

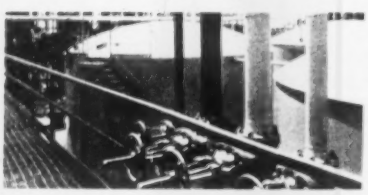
Republic Steel Corp. says that 1954 will be a period when industry can catch up with itself after



nearly 15 years of all-out emphasis on production. More leisure and the virtual elimination of overtime will allow more attention to efficiency and economies. Republic stresses the need for product diversification. It has broadened into production of iron powder, titanium, kitchen cabinets and plastic tubing.

Thompson Products Inc. expects sales of new automotive products to offset the decline in volume for existing products caused by fewer auto assemblies in 1954 than in 1953. "Looking further ahead, the upward population trend and the continuing demand for transportation furnish ample basis for expecting a continuing long-term growth in the automotive industry."

Union Carbide & Carbon Corp., which passed the $1-billion sales mark last year, pins its hopes on



technology to keep sales even higher in 1954 and beyond. Special emphasis in the future will be given to synthesis of organic chemicals and the development of improved plastic products; to the field of metallurgy and the use of electric furnace products; to the art of separating and treating atmospheric and hydrocarbon gases for metallurgical, chemical and other uses; and to the increased use of carbon as an inert substance required by industry in many forms.

U. S. Steel Corp. estimates that $327 million will be needed to complete all replacements and additions authorized by Jan. 1. Chairman Benjamin F. Fairless points out that four basic requirements for prosperity are peace, price stability, free and open markets and a good climate for private enterprise as provided by the government. We now have the first three requirements, he says, and the government is striving to provide the fourth.

Westinghouse Electric Corp. says: "Even if the level of general business for 1954 is moderately lower than in 1953, we are planning for and aiming toward larger billings and profits in the coming year."

Fast Write-Offs Still Hefty

U. S. Steel Corp. received the largest certificate of necessity issued by the Office of Defense Mobilization in the period from Mar. 11 through Mar. 24. On metallurgical by-product coke facilities at Joliet, Ill., it received a certificate for $15,925,000, with 45 per cent allowed. For similar facilities the National Tube and Tennessee Coal & Iron Divisions were certified, respectively, for $12,930,000, with 50 per cent allowed, and $10,660,000, with 45 per cent allowed.

During the same period large certificates were also granted to the following companies: Capitol Tank Car Corp., $3 million, with 70 per cent allowed; Young Radiator Co., $2.2 million, with 45 per cent allowed; and, Commercial Barge Lines Inc., $1.2 million, with 70 per cent allowed.

Including the latest certificates, accelerated tax amortization amounting to $29,502,163,000 has been granted for 18,991 new or expanded facilities. Of the amount certified 60 per cent or $17,715,570,000 is eligible for rapid depreciation.

Packed with Sales Appeal

AMA conference shows packaging trends are slanted toward the customer's needs

WRAPPING industry's products in greater sales appeal at lower cost is altering emphasis in the packaging field.

The trend is toward building packaging around the customer and his needs, some 25,000 packaging experts learned at the 23rd National Packaging Conference and Exposition in Atlantic City last week. Sponsored by American Management Association, the show demonstrated versatility of packaging in creating preferences, catalyzing impulse buying and staying ahead of competition.

Fast Growing—Today's packaging sales are estimated at some $11 billion, and the growth potential is high.

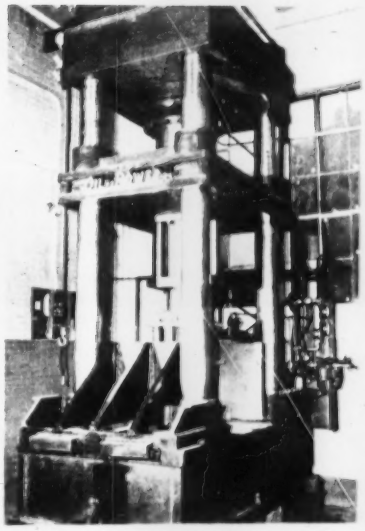
One survey of industrial packaging costs shows the average percentage of manufacturers' selling price represented by packaging ranges from 10 per cent for inks and adhesives to 1.4 per cent for office machines. Monsanto Chemical Co. estimates every 1-per-cent reduction in the per cent of container weight to gross weight is worth $7000.

Needed for Speed—Quality and uniformity in materials are key needs of materials for today's speedier packaging lines, said John A. Warren, American Home Products Corp., New York, in detailing radical changes ahead in the industry. Continuous annealing of steel strip would permit use of lighter gages in containers. Differential coated electrolytic tin plate, organic coatings and side-seam cements should widen the market for the tin can.

Aluminum foil for lining containers is enjoying unprecedented growth, said Mr. Warren. He pointed to films as the fastest growing branch of the packaging industry, but with "many lessons to learn." Polyethylene will grow in use; polyester films are arousing great interest, as is the vacuum-formed plastic package.

More Metal Cans—Packing metal products in metal containers is opening new markets for cans, according to R. S. Solinsky, president, National Can Corp. Welding electrodes, bearings, gear cutters and powdered metals are now packaged in cans, while experiments are now under way on saw blades and similar products.

Can manufacturers shipped 38 billion metal cans last year. Cost cutting ideas include motor oil cans from black plate with cemented side seams, resin coating sheet stock before deep drawing, drawn and concaved-seamed bottom low-pressure cans.



To Press Titanium Powder

Squeezing shapes from titanium powders will be task for this 1250-ton split die hydraulic press recently installed at Firth Sterling Inc., McKeesport, Pa. Manufacturer is Oilpower Engineering Co., Schenectady, N. Y.

Machinerymakers Thrive

Packaging machinery makers are wrapping up a good year.

Many of them are operating at higher levels than in any postwar year, and order backlog is at a new all-time high, says R. T. Foreman, director of sales, R. A. Jones & Co., Cincinnati, and president of Packaging Machinery Manufacturers Institute.

Orders are up 14 per cent and shipments in 1954 will probably be 11 per cent higher than in the period 1950-1953, predicts Mr. Foreman. Results will be a carryover into 1955 that should insure good business next year, too.

More Birthmarking?

BDSA will get behind the Air Force program for mill marking of rolled metal products

THE ARMED SERVICES' campaign to get mill producers of metal rolled products to birthmark these shapes advanced another step when Business & Defense Services Administration gave assurance it will co-operate.

Following a conference at which armed services spokesmen explained the move to the Iron & Steel, Aluminum and Copper divisions, BDSA agreed to find out what it could do to help universal adoption of mill marking.

Reasons—Purpose of the campaign, BDSA divisions were told, is to permit ready identification of metal products in consumers' inventories; to facilitate sorting out of inventory in case of bombing raids; and to facilitate salvage of scrap.

Armed services spokesmen declared that the objection that such marking entails high cost for which big extras would have to be charged is not valid. They told of seeing carbon sheet marking procedures at a number of mills which, by means of a marking wheel geared to the rotary shear, print marks on 30-inch centers down the middle of the sheet at speeds of 100 to 150 feet per minute. The cost of marking in these instances was reported as "negligible."

AF Pressure—The Air Force has been intensifying its policy of denying orders to steel mills that either do not incorporate a marking commitment in their bids, or which include a marking extra the Air Force regards as exorbitant. In March, the Air Force steel procurement center at Topeka, Kans., deprived at least 12 steel companies of orders because they did not quote acceptable terms for marking.

That Air Force center, which buys several thousand tons of galvanized sheets, aircraft quality bars and other products monthly, placed the business with warehouses which have marking equipment. The Air Force justifies the higher cost of warehouse steel by the benefits of marking.

Renting . . .

How To Go About It

TO LEASE or not to lease? That's a question which STEEL's articles Mar. 29 and Apr. 5 attempted to help you find answers for. Not everyone should lease, but if you have decided to, you have a chance to broaden markets if you're a builder or of modernizing at minimum capital outlay if you're a user. Here are some ideas to help you get started.

LEASING EQUIPMENT is something like flying an airplane: you have to learn how to do it, you have to learn the legal rules affecting it and you have to learn what to do if anything goes wrong.

If after studying the advantages and disadvantages of leasing (STEEL, Mar. 29, p. 67, and Apr. 5, p. 67) you want to try it, you should still go into it with care, whether as a lessor or lessee.

What Builders Should Do—If you're a builder, the first task is to find financing. Your requirements on leased equipment will be much higher than on sold equipment. Banks are conservative about this, but some will do it. A better bet may be industrial financing organizations, such as CIT Corp., New York, or Commercial Credit Corp., Baltimore. Insurance companies are also interested.

Or you may prefer to by-pass the whole question of financing and let some leasing broker handle it. That's essentially what firms like Rentco Inc., Philadelphia, or U. S. Leasing Corp., San Francisco, are. They're growing rapidly in number, too. Bank of America reports that no fewer than 20 firms or individuals in the last six months have approached it for financial support in forming leasing firms. Under the most common plans, the leasing company finds a firm that wants to use equipment, then arranges financing, finally buys the equipment from the builder and leases it to the user.

But leasing brokers may not be able to give you the volume you require. In that case, you had better find your own financing. If you are going into leasing on a modest scale, you may even be able to handle it yourself. A few companies are planning to do that for the time being. Yet, that isn't practical if you plan to go into it on a permanent and substantial scale. Remember that Signode Steel Strapping Co., which has done this kind of marketing since the 1920s, has equipment with an original cost of $6 million and a depreciated value of $3 million in the hands of its customers now.

The Mechanics—If you decide not to sell to some leasing broker, then your next step is to determine the mechanics of handling your leases. You can set up a subsidiary, as Yale & Towne Mfg. Co. has; you can do it through your regular organization, as Signode does; or you can handle it through local representatives, as Clark Equipment Co., Buchanan, Mich., does. The latter method is a fairly unusual arrangement. Sentiment among machine tool distributors, for example, is not to touch leasing on that basis, but to let the manufacturer take over. Once the mechanics are taken care of, the builder must sell leasing. It will probably be tougher than selling purchasing.

What the User Should Do—If you're thinking of becoming a lessee, your first problem is to determine whether it's more advantageous to rent or buy. While that's primarily a matter of dollars and cents, there are intangibles that should be weighed, too. Is service better under a lease or purchase? Will you get better technical advice from the builder if you lease than if you buy?

There are some dangers in your contract, also, that should be watched for. Are there any restrictions on what you make with the leased equipment? Are there any clauses or equipment gimmicks that require you to buy the

lessor's product or accessories that are used in the machine?

Dual Consideration—When the preliminary considerations for both lessor and lessee are taken care of, it's time for a joint consideration of the details of a contract. In his memorandum on "The Leasing of Industrial Equipment," Frank Griesinger of Lincoln Electric Co. suggests these major points bear watching:

Term of the Lease—Lease contracts can run from two to about ten years. The average runs about five. There's no such thing as typical terms, but the accompanying sample of Kearney & Trecker Corp.'s plan gives you one company's solution.

Lease Payments—Generally the net purchase price of the equipment is divided into monthly, quarterly or semiannual installments. Often a choice is given the lessor as to how he wants to make his payments. In some plans, payments in the earlier years may be greater than the later years, to reflect the faster depreciation of the equipment. If rental rates parallel the double-rate declining balance method of depreciation, they are certain to be on a declining basis. Watch out for rental payments that in two years or less are equal to the value of the equipment. The Internal Revenue Service will be dubious.

Lease Renewal — Almost all plans provide for continuing lease of the equipment beyond the initial leasing period. Frank Griesinger of Lincoln Electric Co. says that rates quoted for renewals of the basic lease term or for year-to-year renewals vary widely from 1 per cent to 50 per cent of the value of the equipment. Watch out for IRS trouble if renewal rates are nominal. As in nominal purchase prices, IRS has been known to view such arrangements as conditional sales.

The Purchase Option — As already explained (STEEL, Apr. 5, p. 67), this one is tricky. Until IRS makes a statement clarifying its position, it's wisest to avoid a purchase-option clause altogether. The practice now is to include it, as in the Kearney & Trecker plan, but to explain its pitfalls to customers.

Lease Financing Costs — The service charge by manufacturers specified in many leasing contracts varies widely from as low as 1.667 per cent of the net equipment value to as high as 6 per cent. All rates are expressed as "add-on" rates. Bank interest rates are usually "simple" interest. An add-on rate of 4 per cent is equivalent to a simple interest rate of 7.38 per cent; 5 per cent is equivalent to 9.23 per cent. Many companies can borrow from banks at a lower rate than that charged under most leasing plans. But bank loans are usually for

KEARNEY & TRECKER TOOL-LEASE PLANS

Percentage figures are percentages of list price of machines)

YEAR	PLAN A.			PLAN B.			PLAN C.		
	Rental Amount	Cumulative Rent	Purchase Amount	Rental Amount	Cumulative Rent	Purchase Amount	Rental Amount	Cumulative Rent	Purchase Amount
1	25%	25%		30%	30%		35%	35%	80%
2	25	50		25	55	60%	25	60	60
3	25	75	45%	20	75	45	15	75	45
4	10	85	40	10	85	40	10	85	40
5	10	95	35	10	95	35	10	95	35
6	10	105	30	10	105	30	10	105	30
7	10	115	25	10	115	25	10	115	25

Customer may terminate or purchase anytime after year 5, 3rd year plan B, 2nd year plan C. Lessor may terminate at the option of lessee but not before 7th year, after that leases are terminable [illegible] Rent and lease terms in equal installments.

Example: Plan B, List price of machine $10,000.00

Year	Rental Amount		Cumulative Rent	Purchase Option Price
1	2 payments of $1500	$3,000	$3,000	
2	2 payments of $1250	$2,500	$5,500	$6,000
3	2 payments of $1000	$2,000	$7,500	$4,500
4	2 payments of $500	$1,000	$8,500	$4,000
5	2 payments of $500	$1,000	$9,500	$3,500
6	2 payments of $500	$1,000	$10,500	$3,000
7	2 payments of $500	$1,000	$11,500	$2,500

shorter terms than are available on leasing plans.

Length of Lease — All leases should have a fixed term specified in the contract. Practices range widely as to cancellation privileges. Few, however, permit cancellation before the contract has run two years. Many allow no cancellation at all.

Insurance—Most contracts provide that all insuring is to be done

First Step: Financing

by the lessee, with prompt notification to the lessor of damages and insurance claims.

Taxes—Most contracts provide for the assumption of local taxes by the lessee.

Equipment Modification — Such changes must usually be approved by the lessor, including any identification or advertising placed on the equipment.

Multiple-shift Operation — In some contracts leasing rate increases when the equipment is being used on more than one shift.

Whether you're a lessor or lessee, it's wise to try to get preclearance from IRS on any leasing plan. That's because of the ambiguity about when a lease is a lease or just a conditional sale.

The U. S. policies now are unnecessarily hindering the spread of leasing. While nobody can condone a mere tax-dodging leasing plan, the vast majority are absolutely legitimate and don't deserve the suspicion IRS too often gives them.

Sensibly policed by the government and wisely used by industry, leasing can help our economy fly to still greater heights of productivity.

Time for Tax Action Is Now

The proposed new revenue code is being studied by a Senate group which will report in May. The House-passed measure has some bugs. Here are complaints being heard

TARGET DATE for the Senate Finance Committee's report on the new Revenue Code Bill, H.R. 8300 as passed by the House, has been set as May 1. But the many complaints coming from businessmen, which will have to receive attention if the committee is to do a conscientious job, makes it likely the bill will not be reported much before May 15.

Even so, businessmen who seek relief from the provisions passed by the House had better act immediately if they expect attention.

Tax Speedup—1. Greatest number of objections are to the further speedup in payment of taxes. (See table below).

Treating Mergers—2. The second largest area of complaints revolves around the 300 section of the bill dealing with corporate organization, acquisition, distribution, adjustments and the like. It introduces new rules governing tax treatment of mergers, stock distribution and consolidation. General feeling is that these rules are more stringent than comparable rules in the 1939 code now in effect.

Depreciation Falls Short — 3. Many complaints center on new depreciation rules. Consensus is that liberalized depreciation rules are fine as far as they go, but they do not go far enough. Some businessmen do not like the declining-balance method of depreciation because under it you never finish writing off a machine altogether. Others, like used machinery dealers, would like to get under the faster amortization methods possible under the declining-balance provisions (see story on p. 53).

Differences of Opinion—4. Manufacturers do not like the bill's provisions which state that the manufacturer's view prevails when the difference between his estimates of the useful life of an asset and that of the Internal Revenue Service is not over 10 per cent. When the difference is over 10 per cent, procedure under the new law gets involved. Most manufacturers think it would be best to adopt a 25-per-cent maximum for estimate differences instead of the 10-per-cent figure.

Narrow Definitions—5. Generally manufacturers feel the proposed treatment of foreign income with an allowance of a 14 point reduction in the tax rate compared with the rate on domestic income is satisfactory. But they think the definitions of business in foreign countries are too narrow.

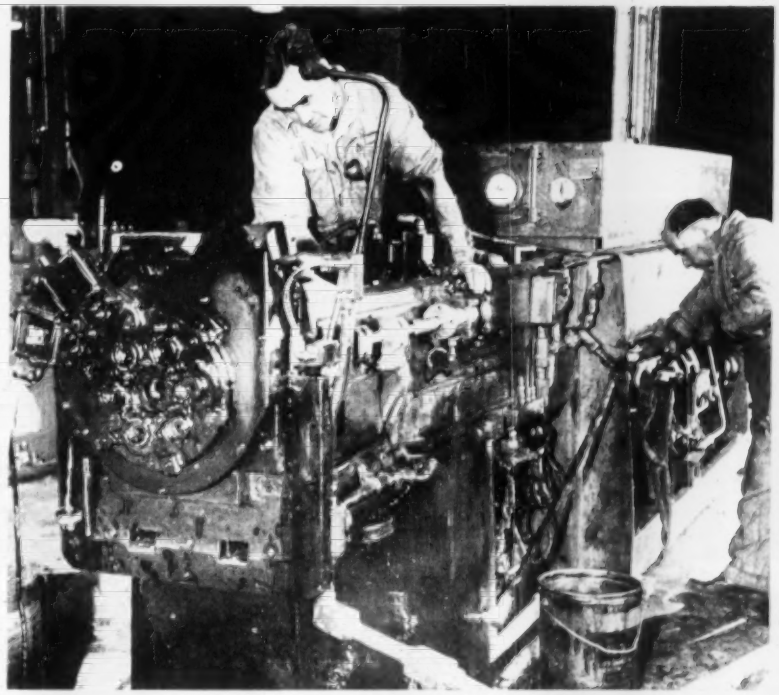
Penalties Remain — 6. There is widespread disappointment over failure of the House to do away with penalty taxes. That is, 2-per-cent penalty for the privilege of filing a consolidated return and 15-per-cent penalty on intercorporate taxes.

Surplus Sorrows—7. Disappointment is general, too, over failure of the House to act adequately in regard to the penalty tax for improper accumulation of surplus. Fear of the penalty tax long has been held to cause companies to distribute surplus funds which are urgently needed for business expansion.

How Much of Your Tax Bill You'll Pay—and When

Current and Proposed Corporate Tax Schedule

	Mar. 15	June 15	Sept. 15	Dec. 15	Total
1954	45%	45%	5%	5%	100%
1955	50	50	5*	5*	110
1956	45	45	10*	10*	110
1957	40	40	15*	15*	110
1958	35	35	20*	20*	110
1959	30	30	25*	25*	110
1960 and thereafter	25	25	25*	25*	100



A depreciation quirk in the omnibus tax proposals could put a . . .

Short Circuit in Used Machinery

H.R. 8300 grants new equipment buyers faster depreciation but excludes used machinery purchasers from the same right. Used machinery dealers protest

"RANK DISCRIMINATION!" That's how used machinery dealers classify the depreciation provisions of House-passed Internal Revenue Code bill, H.R. 8300, Section 167.

The bill limits liberalized depreciation methods to "property new in use and therefore never before subject to depreciation allowances." Dealers in rebuilt, reconditioned or used machinery say that this limitation, if allowed to stand, will act as a deterrent to their own business and to the great majority of equipment users who buy used machinery, including most small and new businesses.

Two Methods—H.R. 8300, as now written, grants new equipment buyers use of the declining-balance method of depreciation with a rate double that which must be applied by used machinery buyers on the straight-line method of depreciation.

It works out like this: A used tool, costing $10,000 and with a useful life of 10 years as decreed by Internal Revenue Service, in five years is depreciated $5000. That's on the basis of straight-line depreciation at 10 per cent per year. A new tool, costing $10,000 and on the declining-balance method of depreciation of 20 per cent per year, is depreciated about $6700 over the same period of five years. The difference in depreciation between used and new is enough to make many manufacturers hesitate to buy a used machine. In fact, the Machinery Dealers National Association says the tax reporting service of Research Institute of America has already advised its subscribers in Question 35, p. 5, of its Mar. 18 report to hold up consummating proposed transactions involving used and rebuilt industrial equipment.

Widespread—If this were to happen on only a small percentage of the equipment on the American market in any one year, it wouldn't be important. But used machinery dealers point out there are some 200 members of the Machinery Dealers National Association and about 500 dealers and brokers outside the organization. Together the industry did about $300 million in sales in 1951 with a 5 to 10-per-cent downward trend in sales evident each year since then.

Some used machinery dealers estimate there are three or four times as many individual sales of used machinery as sales of new machine tools each year. Used machinery serves the vital function of allowing small and new companies to start small by buying cheaper, used equipment and gradually upgrade until they're buying new tools.

A Heavy Hand—This depreciation disadvantage threatens the sales outlook for used machinery dealers. Last month came promise of a recovery from the readjustment slump. Prices had declined from 10 to 30 per cent from a year before. "Most dealers took what they could get if they needed the money," said one Pittsburgh dealer. Interstate Machinery Co. Inc., Chicago, said prices were down a maximum of 30 per cent, but things improved in the latter part of March and "further dips aren't expected." A New York firm reports its business was way off in January and February but began an upturn in March.

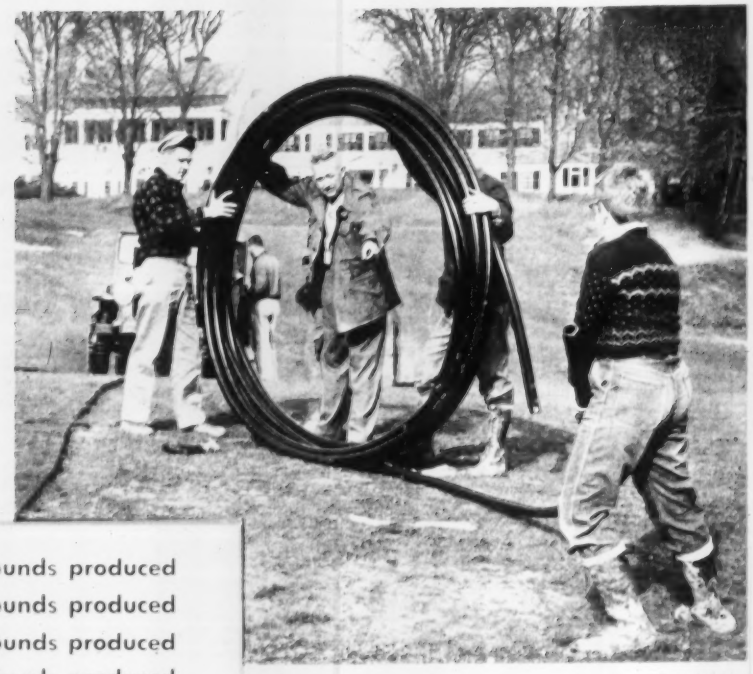
The question was whether these signs of an upturn would get nipped by the uneven tax provisions. Said Galbreath Machinery Co., Pittsburgh, late last month: "Yes, there are some signs of a pickup in orders, but buying hasn't improved any yet."

Gets To Work—Said R. K. Vinson, executive director of MDNA, "Used machinery sales are very sensitive to business trends because used machines are available for immediate delivery and they go to work right away. There have been quite a few inquiries for new business in the last month or two. But buyers are hesitating on the basis of the tax situation."

MDNA is already requesting remedial action on H.R. 8300 with the Senate Finance Committee, now studying the measure.

PLASTIC PIPE:

Free Flowing Sales Future



Republic Steel

1954*	30 million pounds produced
1953	25 million pounds produced
1952	15 million pounds produced
1950	5 million pounds produced

*Estimated — Source: Society of the Plastics Industry

RESEARCH development and public acceptance remain the key factors in the future of the comparatively new plastic pipe industry.

Sales in 1953, according to the Society of the Plastics Industry, hit the $22-million mark, and industrymen are predicting a 20-per-cent increase for this year. For metalworkers in the pipe business, particularly in the smaller sizes, the plastics industry poses a real challenge for many future markets.

Best Seller — By far the most widely used type of plastic pipe is the flexible polyethylene pipe which is finding its way into more and more water system uses. These include jet wells, water lines and irrigation on the farms, coal mine draining, home and golf course sprinkling. This type of pipe accounted for all but 3 to 4 million pounds of total plastic pipe shipped last year, SPI says.

The semirigid butyrate pipe is the second most widely used plastic pipe. More costly than polyethylene, butyrate's biggest potential, say plastics officials, is in the oil fields where sour crudes, paraffin and brine are piping headaches.

Problems — In efforts to get greater heat resistance and higher tensile strength, current research projects include fibrous glass treated with polyester resin, styrene copolymer, phenolic extrusions and others.

Several co-operative projects sponsored by the industry to set up standards for plastic pipe and to break down public resistance to some suggested applications are under way. To crack the water pipe market, the industry is co-operating with the National Sanitation Foundation in a study to determine whether thermoplastics present a health hazard.

Plastic pipe producers are booming their sales chart curves upward with these claims for their product: Corrosion resistant, shock resistant, lower installation cost, lower maintenance cost, lighter weight. One spot check shows this price comparison: In the half-inch size, galvanized steel cost 10.1 cents, black pipe 8.7 cents, stainless steel $1.28, copper tubing 27 cents, aluminum 18.4 cents, brass 6.5 cents, polyethylene 11 cents, and butyrate 19 cents per foot.

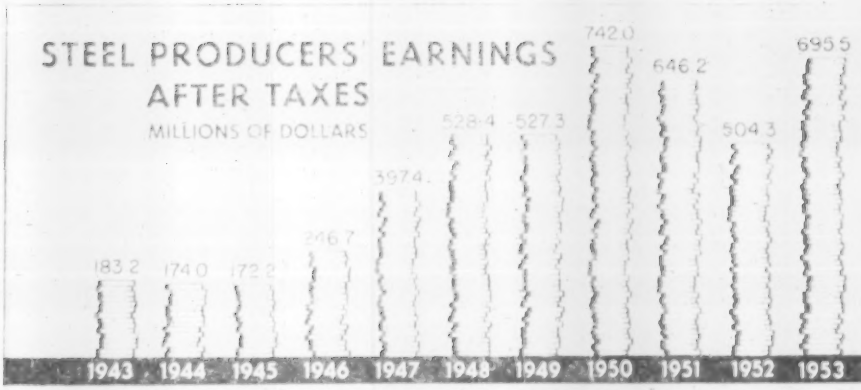
Metal Entries—Seeing the potential in the plastic pipe future, Republic Steel Corp. and Youngstown Sheet & Tube Co. were the first of the big metal pipe producers to enter the plastics field.

Republic officials report that sales at its Magnolia, Ark., plant are "going as expected." Most popular line for the company is the polyethylene pipe in the ¾-in. through 11¼-in. sizes.

Fiber Glass—Youngstown Sheet & Tube produces pipe of fiber glass treated with polyester resin, similar in characteristics to that used in plastic auto bodies. "Most of our pipe is used in the oil fields," officials say. Company is planning expansion in the fiber glass type pipe for use on farms and in chemical, petroleum and gas industries.

Just how big a bite plastic pipe producers will take from the traditional metal pipe market is anybody's guess. There's more than one pipe producer experimenting with a plastic coating for metal pipe to buck the competition.

More Coming?—And more metal pipe producers may enter the plastics field. In announcing its quarterly report, Mueller Brass Co., Port Huron, Mich., said it is entering the field and will produce polyethylene pipe. U. S. Steel Corp. has been conducting experiments with plastic pipe, but to date says it "has no plans for commercial production."



29th ANNUAL FINANCIAL ANALYSIS OF THE STEEL INDUSTRY

Supplement to STEEL
A PENTON PUBLICATION
April 12, 1954

1953: No. 1 for Sales; No. 2 for Earnings

THE steel industry in 1953 set new records in production and sales but not in earnings. Dollar volume of earnings was second best in history. The earnings record set in 1950 still stands.

One of the checkpoints on net profit in 1953 was federal income tax rates, which were higher than in 1950. Also holding down net profits in 1953 were unusual and nonrecurring costs of starting up new facilities. That year, which saw the conclusion of most of the postwar expansion program in the steel industry, was marked with an increase of 6.8 million net tons in ingot capacity. This addition of capacity helped the industry set an all-time production record of 111.6 million net tons of ingots, and the resultant record in sales.

Less for Uncle Sam

Although federal income tax rates in 1953 were high, the total dollars collected by Uncle Sam fell somewhat below the 1951 record take. Holding down the 1953 federal tax bill was fast amortization of new facilities that were built under certificates of necessity in the big expansion program that followed the outbreak of the Korean war. In fact, fast amortization played an increasingly important role in the steel industry's financial results in 1953. This fast amortization is available for five years after completion of the construction projects, and by 1953 a substantial portion of the latest cycle of the steel industry's expansion had become subject to the fast writeoff privileges. The amounts charged to fast depreciation reduced the amount of earnings that were subject to federal income taxes.

The new sales record set in 1953 by the steel industry was $13,350,000,000. Previous record was established in 1951 by sales of $11,811,953,248. Net profit of the industry in 1953 was $715 million. The record set in 1950 was $766,917,956. These 1953 totals for the industry were computed on the performance of 31 companies covered in STEEL's 29th Annual Financial Analysis of the Steel Industry. The 31 steel producers represent 93.4 per cent of the industry's ingot capacity.

Exceptions to the Rule

While the industry as a whole did not set a profit record in 1953 some members of it did.

Total net profit of the industry in 1953 rose over that of 1952 by 3.8 per cent, while sales climbed 21.6 per cent. As a result, net earnings per dollar of sales moved up to 5.63 cents from 4.96 in 1952.

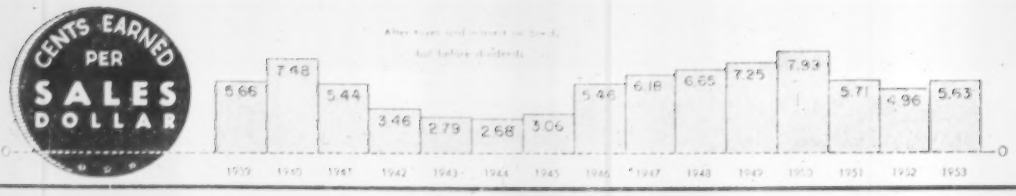
In comparing 1953 with 1952 it must be remembered that 1952 was marred by a two-months' strike of steelworkers. While 1953 set a record in production and sales, the record might have been even bigger were it not for the fact 1953 marked the close of an unprecedented 13-year period in which the demand for steel stimulated by two wars and work stoppages ran ahead of production possibilities. However, the close of the Korean war in early 1953 and the big expansion of the steel industry's capacity reversed the situation, and quickly the demand for steel was lower than production capacity. The industry's ingot production was at 100 per cent of capacity in the first half of 1953 and tapered off in the last half. The companies represented in STEEL's analysis had a combined average steel ingot operating rate of 93.62 per cent that year.

The new record in sales came not only from a record physical volume but also from increased prices on steel. They were raised in mid-1953 to compensate for an 8.5-cents-an-hour wage increase given at that time to steelworkers. During the first quarter of the year, government controls on prices and wages were still in effect.

The increase in wages, along with a record high in employment, boosted total payrolls to a new peak. The average number of employees in 1953 was 835,615 persons, compared with the previous peak of 819,595 in 1951. The new record in payrolls was $1,021,736,666.

More Workers, More Owners

Not only did the number of employees rise but so did the number of owners. In 1953 there were 3 per cent more holders of common stock and 1.2 per cent more common shares outstanding than in 1952. Net earnings per share of common stock were up, too. In 1953 they were $6.81, compared with $1.87 in 1952, thanks to the improved earnings performance of the industry in 1953.



	Rated Ingot Capacity, Net Tons		Ingot Production, Net Tons		Steel Operating Rate, Per Cent		Net Income Per Ton Ingots Produced	
	1953	1952	1953	1952	1953	1952	1953	1952
United States Steel Corp.	38,715,000	36,399,000	35,827,000	29,436,000	98.43*	84.97*	$6.20	$4.88
Bethlehem Steel Corp.	17,600,000	16,800,000	17,662,687	14,116,342	100.36	84.03	7.58	6.44
Republic Steel Corp.	10,262,000	10,262,000	9,630,454	7,991,238	94.50*	82.80*	5.89	5.54
Jones & Laughlin Steel Corp.	6,166,500	5,960,000	6,033,000	4,710,000	95.97*	83.71*	5.14	4.14
National Steel Corp.	5,650,000	5,100,000	NA	NA	NA	NA	NA	NA
Youngstown Sheet & Tube Co.	5,520,000	4,947,500	5,091,876	3,937,490	102.92*	90.10*	6.06	5.82
Armco Steel Corp.	4,962,000	4,718,000	4,704,773	4,042,473	95.98	85.86	7.21	7.75
Inland Steel Co.	4,500,000	3,906,233	4,515,076	3,307,253	100.29	84.66	7.50	7.18
Colorado Fuel & Iron Corp.[4]	2,311,785	2,024,000	2,130,451	1,892,485	92.16	93.50	3.77	3.01
Wheeling Steel Corp.	1,860,000	1,860,000	1,797,419	1,464,985	96.64	78.76	6.93	7.48
Sharon Steel Corp.	1,550,000	1,550,000	1,527,706	1,284,170	98.56	82.85	4.39	3.99
Kaiser Steel Corp.[4]	1,536,000	1,380,000	1,458,904	1,381,862	100.06*	100.13*	6.25	7.53
Pittsburgh Steel Co.	1,404,000	1,152,000	1,037,335	971,029	86.44*	84.29*	4.48	5.30
Crucible Steel Co. of America	1,351,400	1,350,700	NA	NA	NA	NA	NA	NA
Granite City Steel Co.	932,000	720,000	937,801	621,574	100.62	86.33	6.92	8.02
Barium Steel Corp.	893,000	893,000	497,790	690,128	55.74	77.28	[13]	[13]
Allegheny Ludlum Steel Corp.	864,200	889,200	680,619	569,921	78.76	64.09	11.45	10.42
Northwestern Steel & Wire Co.[5]	825,000	825,000	440,503	313,857	53.39	38.04	.69	5.83
Newport Steel Corp.[6]	708,537	708,537	528,024	399,666	74.52	56.41	6.07	4.76
Lukens Steel Co.[7]	675,000	675,000	763,879	555,102	113.17	82.24	4.72	4.17
Detroit Steel Corp.	660,000	660,000	529,044	529,432	80.16	80.22	9.89	8.08
Alan Wood Steel Co.	625,000	625,000	598,334	658,449	95.73	105.35	5.37	3.42
Copperweld Steel Co.	618,380[15]	618,380[15]	[16]	[16]	[16]	[16]	[16]	[16]
McLouth Steel Corp.	579,700	579,700	528,733	491,756	91.21	84.83	9.91	8.60
Laclede Steel Co.	440,000	410,000	427,514	413,292	97.16	100.80	6.32	5.16
Rotary Electric Steel Co.	425,000	425,000	299,776	323,959	70.54	76.23	7.55	5.69
Keystone Steel & Wire Co.	425,000	425,000	356,969	389,762	83.99	91.71	11.63	10.45
Continental Steel Corp.	394,000	394,000	362,048	325,138	91.89	82.52	4.43	4.54
Midvale Co.	353,373	324,947	79,131	99,967	22.39	30.76	17.16	11.89
Carpenter Steel Co.[4]	76,731	73,474	73,503	72,379	95.79	98.51	43.97	39.56
Vanadium-Alloys Steel Co.[4]	42,000	19,000	13,716	15,208	32.66	80.04	79.91	82.37
Total (or average)	112,865,606	106,614,671	98,534,065	81,004,917	93.62	81.37	$6.48	$5.68

	Number of Shares of Common Stock Outstanding		Common Stock Valuation		Preferred Stock Valuation	
	1953	1952	1953	1952	1953	1952
United States Steel Corp.	26,109,756	26,109,756	$870,325,200	$870,325,200	$360,281,100	$360,281,100
Bethlehem Steel Corp.	9,582,942	9,582,942	303,459,830	363,459,830	93,388,700	93,388,700
Republic Steel Corp.	5,952,919	5,902,719	137,021,601	136,060,726	28,204,300	28,204,300
Jones & Laughlin Steel Corp.	6,200,654	6,200,654	62,007,000	62,007,000	29,357,000	29,357,000
National Steel Corp.	7,362,045	7,362,045	73,620,450	73,620,450	None	None
Youngstown Sheet & Tube Co.	3,350,016	3,350,016	105,088,053	105,088,053	None	None
Armco Steel Corp.	5,214,989	5,214,994	52,149,886	52,149,936	None	None
Inland Steel Co.	4,907,654	4,899,380	62,852,323	62,502,746	None	None
Colorado Fuel & Iron Corp.[4]	2,478,084	2,158,084	12,391,021	10,791,021	12,043,396	2,375,967
Wheeling Steel Corp.	1,423,897	1,423,897	37,021,322	37,021,322	35,752,600	35,752,600
Sharon Steel Corp.	1,100,000	1,100,000	11,060,390	11,060,390	None	None
Kaiser Steel Corp.[4]	3,200,000	3,200,000	3,200,000	3,200,000	40,000,000	40,000,000
Pittsburgh Steel Co.	1,281,208	1,182,651	12,847,236	11,017,188	24,194,300	24,194,300
Crucible Steel Co. of America	687,180	634,985	17,179,514	15,874,644	29,436,700	29,840,600
Granite City Steel Co.	1,544,044	1,376,477	19,398,588	17,238,068	12,135,900	12,137,600
Barium Steel Corp.	2,299,859	2,259,857	2,299,859	2,259,857	None	None
Allegheny Ludlum Steel Corp.	1,689,358	1,656,233	1,689,358	11,245,171	8,134,600	8,134,600
Northwestern Steel & Wire Co.[5]	817,825	817,825	4,089,125	4,089,125	None	None
Newport Steel Corp.[6]	1,078,546	1,078,547	1,078,546	1,078,547	None	None
Lukens Steel Co.[7]	317,976	317,976	3,179,760	3,179,760	None	None
Detroit Steel Corp.	2,419,017	2,371,586	2,419,017	2,371,586	None	None
Alan Wood Steel Co.	624,812	606,377	6,248,120	6,063,770	6,457,500	6,525,000
Copperweld Steel Co.	515,188	514,861	2,575,940	2,574,320	4,336,900	4,486,000
McLouth Steel Corp.	1,189,600	951,680	2,974,000	2,379,200	None	None
Laclede Steel Co.	206,250	206,250	4,125,000	4,125,000	None	None
Rotary Electric Steel Co.	348,350	290,413	3,483,500	2,904,130	None	None
Keystone Steel & Wire Co.	1,875,000	1,875,000	2,604,167	2,604,167	None	None
Continental Steel Corp.	501,361	501,361	7,018,789	7,018,789	None	None
Midvale Co.	600,000	600,000	10,574,621	10,574,621	None	None
Carpenter Steel Co.[4]	427,125[18]	427,045[18]	2,135,625[18]	2,135,225[18]	None	None
Vanadium-Alloys Steel Co.[4]	412,157	412,052	2,000,000	2,000,000	None	None
Total (or average)	95,717,812	94,585,666	$1,838,120,841	$1,838,019,845	$683,722,996	$674,677,767

Boldface type is used under those columns in which figures from all 31 companies were not received. NA—Not Available
*Denotes a credit. ‡Denotes a deficit.

[1] Excluding amount maturing within one year.
[3] After federal income taxes.
[4] Including funded debt due within one year.

Net Income Per Ton Ingot Capacity 1953	1952	Capitalization Per Ton Ingot Capacity 1953	1952	Average Number Employed 1953	1952	Total Payrolls 1953	1952	Funded Debt[1] 1953	1952	1953
$5.74	$3.95	$59.90	$60.36	301,560	294,263	$1,425,536,822	$1,207,943,140	$ 61,475,699	$ 61,607,129	$1,024,050
7.61	5.41	66.12	72.50	159,787	155,533	735,673,606	634,213,866	154,911,000	298,314,000	611,874
5.53	4.31	60.50	59.09	69,463	69,411	346,686,636	290,439,198	150,818,613	165,681,945	304,830
5.03	3.30	79.85	84.68	43,836	43,558	209,604,000	182,235,000	119,973,000	144,652,000	281,036
8.91	7.36	74.02	75.50	28,975	29,102	159,822,220	141,957,529	55,000,000	55,000,000	290,902
5.59	4.63	76.99	80.81	27,381	25,600	136,388,905	108,664,549	100,000,000	93,100,000	219,905
6.92	6.64	79.34	79.68	28,917	28,232	151,260,852	132,218,609	75,281,460	80,519,945	261,499
7.53	6.08	80.20	88.76	27,071	26,058	142,348,636	119,128,381	111,146,500	113,996,500	186,898
3.47	2.85	70.71	65.34	22,215	17,127	89,810,255	67,120,096	60,500,000	48,500,000	78,524
6.70	5.89	110.74	108.44	15,248	15,544	85,288,816	72,113,017	52,886,900	55,024,900	80,307
4.33	3.30	44.73	43.88	10,078	10,105	50,315,063	40,485,617	6,850,000	7,850,000	51,416
5.94	7.54	156.80	150.82	8,445	7,475	38,220,067	30,529,185	140,557,201	113,126,851	57,090
3.87	4.47	95.44	90.45	9,171	9,404	48,269,493	44,166,135	35,395,836	28,437,668	42,088
3.78	3.99	90.51	91.99	16,850	16,425	80,965,000	66,352,000	36,396,000	41,637,000	39,308
6.96	6.92	97.51	114.79	4,512	4,362	21,786,428	18,268,752	33,613,125	31,204,375	25,730
[13]	[13]	[13]	[13]	4,850	6,863	28,802,019	27,442,790	None	None	18,797
9.02	6.68	126.26	119.54	15,288	15,211	75,464,864	60,253,346	29,556,000	30,860,000	69,738
.37	3.19[14]	19.20	37.20[14]	2,436	2,366	11,985,196	10,113,654	3,348,192	5,783,692	11,749
4.52	2.69	30.94	31.43	3,091	4,421	17,776,598	13,710,690	335,030	953,030	20,505
5.34	3.43	45.45	43.91	5,530	5,419	27,702,600	21,698,838	4,418,000	5,417,000	23,078
7.92	6.48	119.43	90.24	4,358	4,906	20,688,106	20,890,667	39,740,000	23,925,876	36,663
5.14	3.60	50.50	48.20	3,569	3,608	16,930,563	16,241,909	3,540,000	4,357,000	15,316
[16]	[16]	[16]	[16]	4,532	3,855	21,820,176	17,155,000	5,827,335	7,107,668	17,310
9.04	7.29	162.20	62.16	1,910	1,818	NA	NA	64,000,000	11,250,000	27,053
6.15	5.20	47.13	42.33	3,036	2,822	14,142,741	12,306,745	3,510,198	1,758,546	13,101
5.32	4.31	43.47	33.86	1,075	1,018	6,512,694	6,322,990	3,698,000	1,000,000	11,293
9.76	9.58	54.50	51.80	2,212	2,256	11,980,118	11,941,398	None	None	20,559
4.07	3.75	45.72	43.43	2,686	2,708	12,921,563	11,626,712	2,800,000	3,000,000	10,997
3.84	3.66	51.89	54.74	3,043	2,950	13,740,504	13,076,598	None	None	7,760
42.12	38.97	319.00	306.39	3,378	3,247	17,495,117	15,852,585	None	None	22,199
26.11	65.93	210.11	459.83	1,112	1,261	4,796,978	5,172,781	None	None	6,824
$6.20	$4.75	$69.30	$70.20	835,615	816,958	$4,024,736,666	$3,419,641,777	$1,358,581,089	$1,433,465,125	$3,888,408

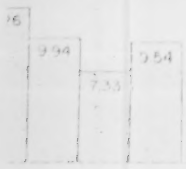
Book Value Per Share of Common Stock 1953	1952	Number of Common Stockholders 1953	1952	Number of Preferred Stockholders 1953	1952	Preferred Dividend Requirements 1953	1952	Net Earnings Per Common Share 1953	1952	Dividends Per Share on Preferred 1953	1952
$72.55	$68.01	230,048	223,619	71,240	71,903	$25,219,677	$25,219,677	$7.54	$4.54	$7.00	$7.00
95.52	86.22	86,191	83,766	21,827	22,318	6,537,209	6,537,209	13.30	8.80	7.00	7.00
74.22	69.88	61,921	58,561	7,324	7,496	1,692,258	1,692,258	9.25	7.21	6.00	6.00
55.32	52.51	39,155	38,240	6,350	6,359	1,468,000	1,468,000	4.77	2.91	5.00	5.00
49.51	44.89	NA	NA	None	None	None	None	6.84	5.10	None	None
97.01	91.56	16,038	15,471	None	None	None	None	9.21	6.84	None	None
60.16	56.66	50,426	50,594	None	None	None	None	6.50	6.01	None	None
50.89	47.49	18,100	16,500	None	None	None	None	6.90	4.85	None	None
36.72	37.71	14,057	11,565	211	228	383,074[10]	54,438	3.09	2.64	3.88[10]	1.16
82.40	77.91	7,547	7,380	4,789	4,658	1,787,630	1,787,630	7.49	6.44	5.00	5.00
56.80	54.70	8,354	8,200	None	None	None	None	6.10	4.65	None	None
18.84	17.18	11,199	12,060	15,696	15,726	2,334,102	2,330,452	2.12	2.52	1.46	1.46
42.88	43.61	3,688	3,554	3,405	3,445	1,307,852[10]	1,307,373[10]	2.61	3.25	10.50[10]	10.50[10]
82.20	83.11	3,370	3,577	5,165	5,772	1,476,280	1,499,961	5.29	6.13	5.00	5.00
29.08[12]	28.50[12]	7,373	6,992	2,204	2,233	667,520[10]	619,950[10]	3.77	3.17	11.60[10]	9.45[10]
9.17	8.67	8,350	8,453	None	None	None	None	1.61	1.22	None	None
42.28	40.61	14,015	13,788	2,455	2,566	355,894	355,894	4.40	3.37	4.38	4.38
19.37	19.00	900	920	None	None	None	None	.37	2.21	None	None
20.01	19.76	5,727	5,785	None	None	None	None	2.97	1.76	None	None
82.58	76.17	1,290	1,318	None	None	None	None	11.35	7.29	None	None
16.16	15.02	3,015	2,567	None	None	None	None	2.16	1.80	None	None
34.51	31.73	1,252	1,123	640	632	323,719	326,250	4.63	3.17	5.00	5.00
38.60	35.56	3,933	3,806	1,058	1,098	251,289[10]	51,339[10]	5.05	4.38	5.50[10]	2.50[10]
25.24	26.04	1,814	1,489	None	None	None	None	4.41	4.44	None	None
83.52	75.61	1,359	1,368	None	None	None	None	13.11	10.34	None	None
42.42	46.11	1,044	993	None	None	None	None	6.49	6.35	None	None
12.35	11.74	4,085	4,075	None	None	None	None	2.21	2.17	None	None
35.93	34.13	2,927	2,952	None	None	None	None	3.29	2.95	None	None
30.56	29.64	3,614	3,821	None	None	None	None	2.26	1.98	None	None
57.31	52.72	3,265	3,205	None	None	None	None	7.57	6.71	None	None
21.41	21.20	1,597	1,419	None	None	None	None	2.66	3.04	None	None
		615,654	598,101	142,364	144,434	$13,801,501	$13,250,431	$6.81	$4.87		

[1] Fiscal years ended June 30.
[2] Fiscal years ended July 31.
[4] Fiscal years ended Oct. 31.
[7] Fiscal years 52 weeks ended Oct. 21, 1953, and Oct. 25, 1952.
[8] Steel operating rate adjusted.
[9] Before special charge of $6,309,253.

Compiled

STE

April 12



THIS SPECIAL REPORT is compiled from data from 31 producers representing 93.4 per cent of the steelmaking capacity in the United States

Surplus 1952	Total Capitalization 1953	Total Capitalization 1952	Provision For Depreciation, Depletion 1953	Provision For Depreciation, Depletion 1952	Total Income Before Dividends and Interest on Bonds[1] 1953	Total Income Before Dividends and Interest on Bonds[1] 1952	Total Income—P Cent of Capitaliza 1953	19
$905,511,345	$2,319,132,239	$2,197,124,774	$236,555,029	$176,918,467	$224,220,307	$145,549,814	9.67	6.
522,795,196	1,163,636,586	1,217,957,726	73,737,870	54,483,282	144,209,686	98,662,545	12.39	8.
276,432,402	620,878,235	606,379,373	41,046,221	25,756,204	61,833,984	48,765,540	9.96	8.
263,580,000	492,373,000	499,596,000	25,341,000	21,411,000	36,206,000	23,412,000	7.35	4.
256,876,254	418,230,397	385,035,319	30,321,536	21,607,143	52,093,332[2]	40,692,327	12.46	10.
201,627,920	424,993,129	399,815,973	30,625,812	17,695,579	27,672,269	24,804,994	6.51	6.
243,238,329	388,931,246	375,908,210	26,916,511	16,726,856	36,412,145	33,915,802	9.36	9.
170,189,501	360,897,312	346,688,747	17,218,686	11,376,156	37,351,581	26,928,021	10.35	7.
70,571,067	163,459,029	132,238,055	6,708,878	5,061,010	10,093,057	7,032,422	6.17	5.
73,908,665	205,968,477	201,707,487	11,435,907	8,096,425	14,323,207	12,800,200	6.95	6.
49,106,450	69,326,465	68,016,840	3,617,514	3,024,506	6,982,526	5,398,962	10.07	7.
51,798,992	240,847,614	208,125,843	12,145,033	7,451,167	14,501,960	13,926,042	6.02	6.
40,354,938	114,525,878	104,203,194	4,070,589	4,305,553	5,586,216	5,622,705	4.88	5.
36,897,933	122,320,246	124,250,177	9,586,262	5,806,987	6,659,495	6,762,790	5.44	5.
22,068,390	90,878,115	82,648,433	3,041,417	2,396,131	8,290,799	5,869,488	9.12	7.
17,328,858	21,097,017	19,588,715	1,571,399	1,201,480	2,321,140	2,746,050	11.00	14.
56,059,279	109,117,980	106,299,053	8,598,389	6,654,413	7,791,287	5,940,324	7.14	5.
11,416,592	19,187,072	21,319,409	1,147,307	793,566	393,163	1,830,601	1.58	8.
20,238,310	21,918,768	22,269,887	1,005,004	1,039,199	3,239,860	1,971,099	14.78	8.
21,010,651	30,675,958	29,637,411	1,779,342	1,261,369	3,918,649	2,573,261	12.77	8.
33,259,861	78,822,956	59,557,263	4,540,796	1,971,303	6,880,616	4,967,953	8.73	8.
13,176,896	31,561,852	30,122,666	2,907,621	2,882,843	3,435,301	2,504,414	10.88	8.
15,735,893	30,051,094	30,113,500	1,463,183	1,025,625	3,142,475	2,377,115	10.46	7.
22,406,696	94,027,396	36,035,896	3,904,413	3,806,061	6,471,766	4,730,757	6.88	13.
11,469,777	20,736,280	17,353,323	1,346,431	1,142,706	2,795,201	2,205,628	13.48	12.
10,486,788	18,474,951	14,390,918	1,020,160	939,280	2,393,049	1,896,684	12.95	13.
19,409,386	23,163,498	22,013,553	981,820	790,125	4,149,946	4,073,232	17.92	18.
10,092,362	20,812,469	20,111,151	1,143,108	603,021	1,717,663	1,505,656	8.25	7.
7,211,690	18,331,858	17,786,311	608,000	597,335	1,357,781	1,188,899	7.41	6.
20,249,553	24,477,278	22,511,877	496,816	434,763	3,231,685	2,863,432	13.20	12.
6,736,956	8,824,560	8,736,956	229,328	173,366	1,096,434	1,252,686	12.42	14.
$3,481,505,970	$7,767,681,805	$7,427,544,049	$565,114,418	$406,835,921	$740,682,580	$514,771,473	9.54	7.

Dividends Per Share on Common 1953	Dividends Per Share on Common 1952	Normal Federal Income Taxes 1953	Normal Federal Income Taxes 1952	Federal Excess Profits Tax 1953	Federal Excess Profits Tax 1952	Total Assets 1953	Total Assets 1952	Current Assets 1953	Current Assets 1952
$3.00	$3.00	$270,000,000	$132,000,000	$53,000,000	$15,000,000*	$3,247,500,000	$2,988,434,756	$1,174,326,637	$1,010,707,3
4.00	4.00	144,500,000	80,200,000	16,500,000	14,200,000*	1,782,955,774	1,610,078,107	978,971,938	851,801,1
4.50	4.00	80,300,000	42,900,000	20,200,000	300,000*	741,391,341	757,786,524	293,852,643	288,323,2
1.95	1.80	27,870,000	3,068,000	30,000	8,296,000*	885,242,000	838,944,000	186,855,000	168,806,0
3.25	3.00	60,225,000	41,350,000	9,100,000	650,000	527,811,538	496,578,152	213,857,733	218,748,0
3.75	3.00	27,900,000	20,380,000	None	3,490,000*	513,970,613	479,214,935	237,348,159	239,455,2
3.00	3.00	43,440,177	38,375,239	7,348,431	4,719,987	464,674,185	464,050,153	201,773,838	204,787,7
3.50	3.00	35,599,000	18,333,000	3,780,000	5,216,000*	432,854,511	400,814,562	211,199,422	193,657,5
1.50	1.50	12,239,900	7,598,800	2,332,500	862,700	215,354,493	176,157,962	100,804,287	69,561,3
3.00	3.00	13,275,000	9,611,000	761,000	2,136,000*	234,185,801	228,226,485	83,705,462	95,952,8
4.00	4.00	6,820,000	3,600,000	420,000	850,000*	86,627,074	85,451,794	52,635,143	52,841,7
.50	.25	9,700,000	9,900,000	None	None	266,529,540	237,002,354	70,558,231	62,843,4
[11]	[11]	3,263,000	4,997,000	None	560,000*	135,270,968	128,751,121	39,547,868	51,949,9
[11]	[11]	6,100,594	5,156,146	796,385	421,360	149,835,868	157,035,710	63,917,741	68,791,6
[11]	1.10[11]	6,953,500	3,917,000	None	1,384,208*	119,268,547	101,697,110	33,783,406	34,326,7
.50	.50	2,594,840	5,086,295	855,000	1,480,000	46,879,541	50,202,097	24,708,881	30,370,1
2.00[11]	2.00[11]	10,320,000	4,520,000	1,350,000	1,620,000*	139,419,075	110,535,971	62,352,431	66,036,2
None	None	485,000	645,000	None	None	33,128,991	32,011,240	7,710,874	8,118,9
.50	.45	2,325,000	1,500,000	75,000	541,600*	26,519,060	31,417,526	14,624,125	16,759,7
3.00	4.00	6,965,000	3,288,361	2,360,000	342,804	46,340,814	44,626,667	27,714,668	28,916,7
.75	1.00	6,127,263	4,593,235	485,000	80,000	91,530,181	78,684,696	24,320,100	25,878,4
1.40	1.40	2,457,000	2,550,000	None	75,000*	40,214,495	39,100,083	15,783,021	15,074,2
2.00	2.00	3,040,000	2,367,500	80,000	6,000	38,058,423	41,954,821	20,565,398	25,402,7
None	None	8,740,000	7,145,000	2,820,000	2,455,000	111,340,205	52,040,503	28,324,299	29,489,1
5.20	4.50	4,075,000	2,657,000	900,000	107,000	21,948,945	23,265,215	14,403,343	13,243,6
3.00[11]	3.00[11]	3,799,000	2,401,000	1,125,000	440,000	20,350,013	17,639,959	7,706,753	7,693,7
1.60	1.60	4,387,555	5,156,219	474,072	960,429	27,599,753	26,784,205	13,017,198	12,231,1
1.40	1.70	1,700,000	1,880,000	[17]	[17]	24,238,582	23,490,734	10,868,828	11,420,3
1.35	1.25	1,647,000	2,218,000	None	None	23,449,723	23,593,061	15,631,528	16,214,1
3.00	3.00	5,884,820	5,334,346	2,038,539	1,746,557	37,654,974	35,583,115	23,688,922	25,956,8
2.45	2.60	1,547,000	2,039,000	513,000	700,000	13,171,959	14,533,925	8,626,311	11,256,4
		$814,680,649	$474,767,141	$127,343,927	$38,696,971*	$10,547,707,987	$9,825,687,546	$4,263,184,188	$3,956,616,9

[1] Includes two classes of preferred stock.
[11] Stock dividends in common declared or paid.
[17] Includes scrip certificates.
[18] Not applicable to company's operations.
[14] Ingot capacity adjusted.
[16] Represents ingot capacity of steel plant only.

Financial Analysis

OF THE STEEL INDUSTRY FOR 1953

come—Per pitalization 1952	Net Sales 1953	Net Sales 1952	Net Profit—Per Cent of Net Sales 1953	Net Profit—Per Cent of Net Sales 1952	Net Income Before Dividends 1953	Net Income Before Dividends 1952	
6.62	$3,861,034,728	$3,137,397,336	5.75	4.58	$222,087,840	$143,687,716	United States Steel Corp.
8.10	2,094,952,155	1,701,541,383	6.39	5.31	133,947,837	90,900,771	Bethlehem Steel Corp.
8.04	1,137,123,547	918,447,135	4.99	4.82	56,743,547	44,274,053	Republic Steel Corp.
4.69	624,387,000	495,401,000	4.97	3.93	31,015,000	19,482,000	Jones & Laughlin Steel Corp.
10.57	634,178,060	548,625,817	7.94	6.85	50,334,130[9]	37,559,477	National Steel Corp.
6.20	554,059,088	439,623,183	5.57	5.21	30,839,716	22,915,822	Youngstown Sheet & Tube Co.
9.02	588,919,900	518,575,218	5.76	6.04	33,902,462	31,337,861	Armco Steel Corp.
7.77	578,610,625	460,451,935	5.85	5.16	33,867,184	23,755,218	Inland Steel Co.
5.32	248,835,574	195,757,164	3.23	2.94	8,031,224	5,761,965	Colorado Fuel & Iron Corp.[4]
6.35	219,509,774	180,285,277	5.68	6.07	12,458,311	10,950,780	Wheeling Steel Corp.
7.94	168,268,508	132,376,426	3.99	3.87	6,709,625	5,120,414	Sharon Steel Corp.
6.69	134,500,041	117,925,049	6.78	8.82	9,121,284	10,399,306	Kaiser Steel Corp.[4]
5.40	141,471,302	130,158,219	3.29	3.96	4,648,195	5,150,034	Pittsburgh Steel Co.
5.44	232,276,000	180,266,000	2.20	2.99	5,109,802	5,394,520	Crucible Steel Co. of America
7.10	87,856,006	74,587,639	7.39	6.68	6,488,452	4,985,954	Granite City Steel Co.
14.02	89,719,175	99,052,028	2.59	2.77	2,321,140	2,746,050	Barium Steel Corp.
5.59	242,091,546	190,060,165	3.22	3.13	7,791,287	5,940,324	Allegheny Ludlum Steel Corp.
8.59	44,317,283	34,049,969	.68	5.38	303,163	1,830,601	Northwestern Steel & Wire Co.[5]
8.85	63,989,993	50,502,854	5.01	3.77	3,205,698	1,903,209	Newport Steel Corp.[6]
8.68	97,850,937	69,616,358	3.69	3.33	3,607,713	2,316,791	Lukens Steel Co.[7]
8.34	93,391,509	87,421,483	5.60	4.89	5,230,259	4,276,666	Detroit Steel Corp.
8.31	59,756,615	60,479,849	5.38	3.72	3,213,690	2,251,073	Alan Wood Steel Co.
7.89	83,803,418	71,642,488	3.40	3.22	2,852,078	2,304,387	Copperweld Steel Co.
13.13	NA	NA	NA	NA	5,241,501	4,227,854	McLouth Steel Corp.
12.71	50,834,319	47,545,026	5.32	4.49	2,703,805	2,132,746	Laclede Steel Co.
13.18	44,150,335	37,212,183	5.12	4.95	2,262,367	1,843,061	Rotary Electric Steel Co.
18.50	44,554,153	48,939,590	9.31	8.32	4,149,946	4,073,232	Keystone Steel & Wire Co.
7.49	36,761,804	35,716,970	4.36	4.14	1,603,163	1,477,030	Continental Steel Corp.
6.68	30,255,784	30,039,172	4.49	3.96	1,357,781	1,188,899	Midvale Co.
12.72	53,936,056	47,680,029	5.99	6.01	3,231,685	2,863,432	Carpenter Steel Co.[4]
14.34	15,649,717	17,284,383	7.01	7.25	1,096,434	1,252,686	Vanadium-Alloys Steel Co.[4]
7.33	$12,357,044,982	$10,158,661,328	5.63	4.96	$695,476,319	$504,303,965	Total (or average)

1952	Current Liabilities[3] 1953	Current Liabilities[3] 1952	Ratio of Current Assets to Current Liabilities 1953	Ratio of Current Assets to Current Liabilities 1952	Working Capital 1953	Working Capital 1952	
,707,373	$828,306,852	$684,151,997	1.42—1	1.48—1	$346,019,785	$326,555,376	United States Steel Corp.
,801,104	577,319,188	352,120,381	1.70—1	2.42—1	401,652,750	499,680,723	Bethlehem Steel Corp.
,323,212	101,542,012	133,133,112	2.89—1	2.17—1	192,310,631	155,190,100	Republic Steel Corp.
,806,000	84,168,000	75,345,000	2.22—1	2.24—1	102,687,000	93,461,000	Jones & Laughlin Steel Corp.
,748,048	78,203,308	73,626,979	2.73—1	2.97—1	135,654,425	145,121,069	National Steel Corp.
,455,241	77,983,998	68,667,688	3.04—1	3.49—1	159,364,161	170,787,553	Youngstown Sheet & Tube Co.
,787,295	67,670,311	80,814,075	2.98—1	2.53—1	134,103,527	123,973,720	Armco Steel Corp.
,657,506	65,588,410	45,261,977	3.22—1	4.28—1	145,611,012	148,395,529	Inland Steel Co.
,561,385	43,954,317	38,047,053	2.29—1	1.83—1	56,849,970	31,514,332	Colorado Fuel & Iron Corp.[4]
,952,873	19,387,251	19,640,825	4.32—1	4.89—1	64,318,211	76,312,048	Wheeling Steel Corp.
,841,761	16,290,609	16,924,954	3.23—1	3.12—1	36,344,534	35,916,807	Sharon Steel Corp.
,843,472	25,681,926	28,876,511	2.75—1	2.18—1	44,876,305	33,966,961	Kaiser Steel Corp.[4]
,949,938	18,698,090	24,547,927	2.12—1	2.12—1	20,849,778	27,402,011	Pittsburgh Steel Co.
,791,669	24,779,142	30,310,862	2.58—1	2.27—1	39,138,599	38,480,807	Crucible Steel Co. of America
,326,718	20,387,999	16,002,597	1.66—1	2.15—1	18,395,407	18,324,121	Granite City Steel Co.
,370,135	17,824,842	23,638,917	1.39—1	1.28—1	6,884,039	6,731,218	Barium Steel Corp.
,036,258	27,751,240	31,899,208	2.25—1	2.07—1	34,601,191	34,137,050	Allegheny Ludlum Steel Corp.
,118,987	12,071,919	9,961,831	.64—1	.82—1	4,361,045‡	1,842,844‡	Northwestern Steel & Wire Co.[5]
,759,755	4,600,292	7,147,639	3.18—1	2.34—1	10,023,833	9,612,116	Newport Steel Corp.[6]
,916,768	15,637,725	14,901,873	1.77—1	1.94—1	12,076,943	14,014,895	Lukens Steel Co.[7]
,878,432	12,707,225	19,127,433	1.91—1	1.35—1	11,612,875	6,750,999	Detroit Steel Corp.
,074,214	7,419,318	7,878,654	2.13—1	1.91—1	8,363,703	7,195,560	Alan Wood Steel Co.
,402,791	7,746,670	11,430,798	2.65—1	2.22—1	12,818,728	13,971,993	Copperweld Steel Co.
,489,191	17,212,809	16,004,607	1.65—1	1.84—1	11,111,490	13,484,584	McLouth Steel Corp.
,243,625	3,887,215	5,611,892	3.71—1	2.36—1	10,516,128	7,631,733	Laclede Steel Co.
,693,709	1,875,062	3,249,041	4.11—1	2.37—1	5,831,691	4,444,668	Rotary Electric Steel Co.
,231,121	4,436,254	4,770,652	2.93—1	2.56—1	8,580,944	7,460,469	Keystone Steel & Wire Co.
,420,398	2,669,175	2,613,659	4.07—1	4.37—1	8,199,653	8,806,739	Continental Steel Corp.
,214,164	4,601,363	5,347,959	3.40—1	3.03—1	11,030,165	10,866,205	Midvale Co.
,956,819	13,171,602	13,065,589	1.80—1	1.99—1	10,517,320	12,891,230	Carpenter Steel Co.[4]
,256,439	4,347,399	5,321,841	1.98—1	2.12—1	4,278,912	5,934,598	Vanadium-Alloys Steel Co.[4]
,616,901	$2,207,921,523	$1,869,443,531	1.93—1	2.12—1	$2,055,262,665	$2,087,173,370	Total (or average)

[3] Comparisons would be misleading as company's operations include a wire and cable division with no steel ingot capacity.
[4] Included within "Normal Federal Income Taxes" for year.
[5] To be issued 123 shares with a valuation of $615 in 1953, 203 shares with a valuation of $1,015 in 1952.

Often it pays to relocate your facilities, but . . .

Move Cautiously on Plant Moves

That cornfield may not be the paradise you thought for a plant site. Industrial development group hears how automation, other factors are changing plant relocation ideas

LOOK BEFORE YOU LEAP if you're thinking of moving your plant or starting a new facility.

That's the advice of industrial real estate and other experts. They spoke before the American Industrial Development Council in Washington when it held its annual conference.

Foresight Needed—"We have not been as critical in locating plants as we should have been," says James R. Allan, International Harvester Co., Chicago. "We would put a plant in a cornfield in open country and then in a few years be hemmed in by residential developments and be faced with other problems. We have learned the hard way that it is necessary to take all factors into account to avoid such difficulties."

The most important factor in selecting a plant location is the need for buffer areas around the plant, Mr. Allan believes. That is to provide space for future expansion and parking facilities and to prevent noise and air pollution from becoming a nuisance.

Water Freight—"In examining the transportation angle, it is wise to make sure of the availability of water transportation since water freights may prove to be one of the last of the controllable elements in costs," says Mr. Allan.

Before you decide to move your plant to a new location as a remedy to a declining-profits operation, don't just look at the external factors in your business. Look at the internal factors as well, advises John O. Tomb, McKinsey & Co., Chicago, management consultants. He cites cases where early plans to move were abandoned after internal examination revealed the declining profit trouble was due to managerial deficiencies.

Mr. Tomb warns industry that it loses every time a plant moves out of its area so that such a removal becomes everybody's business. "Every time you let a plant move out, your community recedes, your power costs tend to go up, the supply of skilled labor tends to diminish, and there is a decline in services."

Automation's Impact — The recent sharp stimulus to the development of automation by industry thrusts some new considerations into the problem of plant location, says Dr. David G. Osborn, University of Chicago professor, who handles warehouse planning and location for Kroger Co., Cincinnati.

"Automation increases output per employee and reduces the plant space requirement. The average space reduction is around 50 per cent. Machinery required for automation is expensive, so that instead of buying new machinery for expansion as demand for the product increases, there should be a trend toward round-the-clock operation of this expensive machinery. Furthermore, automation brings a reduction in the number of production employees and an increase in the number of maintenance men. Proximity to quick instrument repair facilities is another factor, often making the urban location the most desirable.

Honesty Pays—If you deal with reputable plant locators and real estate men, premature word of your plans will not get out to the public, says Harry P. Richter, manager, Real Estate Division, United States Steel Corp. Many people knew all about the Fairless plant and had a hand in working it out, but none of them ever "leaked."

Mr. Richter cautions that the free rent and tax remission which is offered by so many communities to attract new industries should not be a factor in causing a company to select a location. You just don't get something for nothing, he says. A location always should be selected in the light of all the facts. Advantages such as a good location or favorable freight rates may far outweigh free rent, tax remission and other benefits.

By E. C. KREUTZBERG Washington Editor

So You Want To Invest Abroad—U.S. Study Shows the Problems

AN AMERICAN manufacturer of pumps and other equipment used in the operation of irrigating systems obtained a contract from the government of India.

After 3½ years so little headway had been made because of Indian government intervention that the firm asked for a new contract. It got it, but under even more onerous terms than the first one. The company would have preferred to back out altogether, but by this time it had a tiger by the tail because it had already sunk too much money into the deal to drop out.

Candor from Commerce . . .

That story isn't unusual, but it is unusual to be found where it is in a Department of Commerce report in response to a congressional demand for a survey to show the nature and magnitude of impediments to private U. S. foreign investment. "Factors Limiting U. S. Investment Abroad" is a surprisingly candid appraisal of the irritations that bedevil Americans attempting to do business abroad. It could serve as a supplement to the Randall Commission's proposals for the nation's trade policies.

Philippine Boomerang . . .

The book tells the factors adverse to U. S. private investors in some 30 countries in the Americas, Western Europe, the Near East and Africa and the Far East and Australasia. The main problem is that all those nations want American capital for their economic development but on their own terms.

Those terms in the case of the manufacturer in India required that at the end of five years only 1 or 2 per cent of the operating personnel could be non-Indians. In addition there was a limitation on the export of profits.

Even the Philippine Republic, which badly needs American capital, has adopted a policy that may paralyze foreign investments. Filipinos decreed that companies financed from abroad can not pay any more in dividends than they had paid in 1948. On the surface, that appears not unreasonable, but the joker is that in 1948 many American companies were pouring money into the islands and taking little out in dividends.

As a result, quotations on Philippine enterprises have been going down on American exchanges, and the flow of new American money to the Philippines has slowed to a trickle.

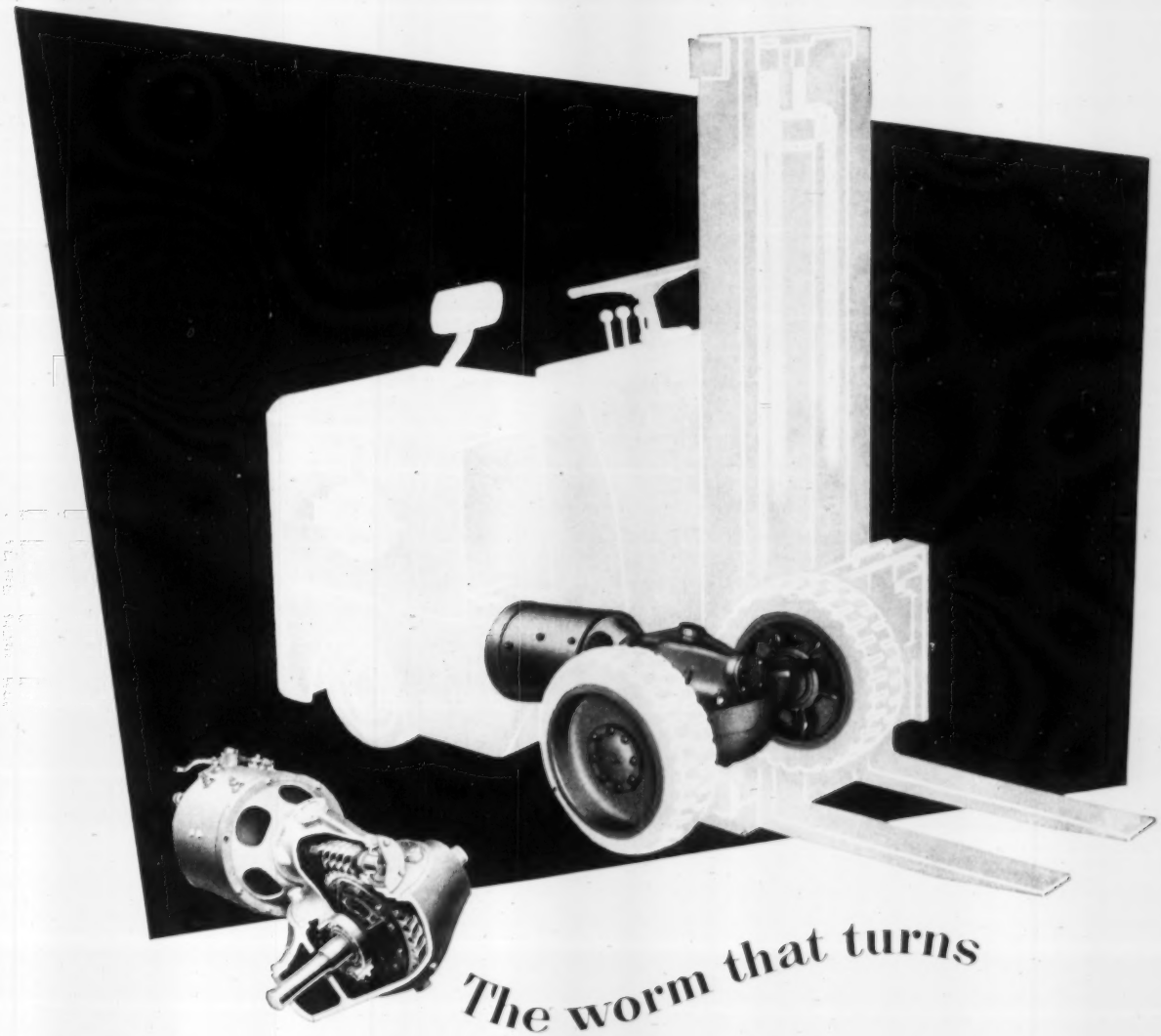
How To Win Friends Abroad . . .

An interesting fact disclosed by the book is that not all United States investors fare alike in the same country. In a country where one American firm got a raw deal, other American enterprises flourish and enjoy fine co-operation. To a considerable extent this depends on the line of business involved; many countries which place high barriers in the path of enterprises that are devoted to luxury products give favorable treatment to those that will advance the country's primary economic needs. And some firms, which make a practice of cutting well selected nationals of the country into their business and into their profits, get along famously.

Primers for Investors . . .

Although this study is designed to inform legislators of problems facing private U. S. investors, it may be even more helpful to you if you're planning investments abroad. True, this report may help our government proceed more effectively in obtaining remedial action from the countries involved, but the study indicates that a lot of an investor's success depends on his own individual know-how. Here's a book that will help you improve that know-how.

It can be obtained for 55 cents from the Superintendent of Documents, Government Printing Office, Washington 25. It's the first of a trilogy. Part 2, now in preparation, is to be entitled "Basic Factors Affecting the Level of U. S. Investment Abroad." It will deal with specific government regulations, balance of payment problems, limitations on export of earnings, etc. The third book, also in preparation, will be especially interesting in showing how typical American foreign investors fare. It will be a resume of experience of some 300 American companies who have made foreign investments with varying fortune.



The worm that turns

...with ever-increasing efficiency

Baker Industrial Trucks use worm gearing in their drive axles, and here's why:

Industrial truck drive systems are called on for punishing, heavy-duty service. Truck operation is comparable to driving an overloaded auto constantly in low gear. Industrial truck transmissions change speed or direction as often as 1800 times during an eight-hour day.

The necessary gear reduction from motor shaft to drive wheels can be accomplished in several ways. The two most common are a gear train of two or more steps with spur or bevel gears, or single-step worm gearing.

The first means more moving parts, more maintenance, and compounded friction losses for each successive step-down. Development of the highly efficient involute worms, new lubricants and new tooth profiles, on the other hand, produce worm gearing efficiencies up to 92%—with fewer components.

One more point: Worm gearing actually increases efficiency with wear since the worm continuously regenerates the "ideal" tooth profile on the worm wheel. In spur or bevel gearing, efficiency declines progressively as teeth wear and lost motion develops.

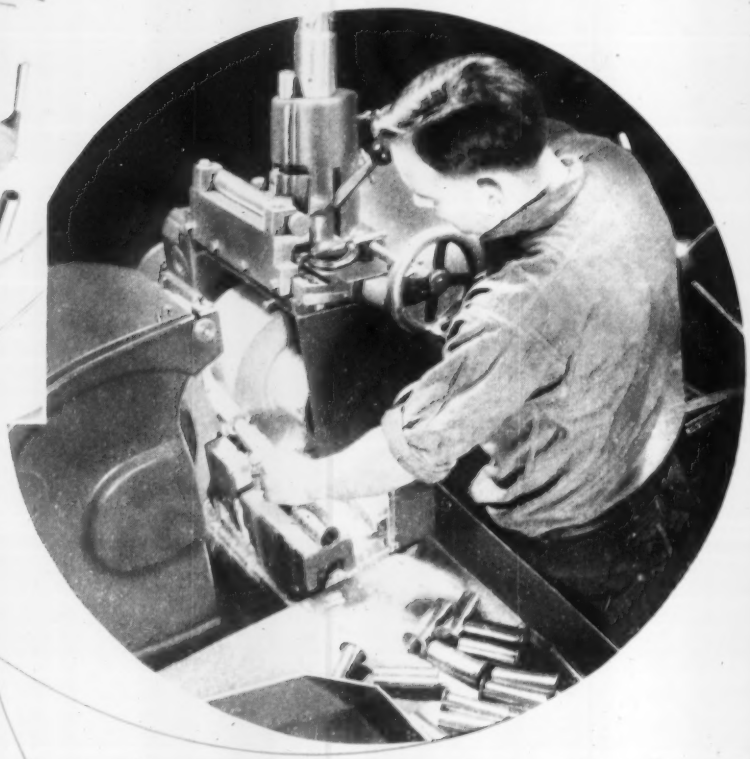
For more detailed information on Baker Fork Truck features, write for 4-color sketch book—Bulletin 64. The BAKER-RAULANG Company, 1259 West 80th Street, Cleveland 2, Ohio.

Baker

Industrial trucks

Above. These widely differing parts were all finished economically by centerless grinding. Materials include iron, steel, stainless steel, brass, aluminum, plastic.

Below. Close up of a CINCINNATI FILMATIC No. 2 Centerless Grinder set up for a typical infeed job. The Hydraulic Profile Truing equipment over the regulating wheel is especially desirable on machines used for small lot production.

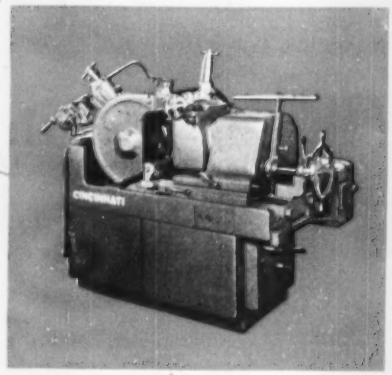


CINCINNATI

Why not take advantage of the Centerless Method

FOR GRINDING SMALL QUANTITIES?

Nearly everyone knows about the advantages of centerless grinding *large quantities* of parts on a CINCINNATI FILMATIC No. 2 . . . the uniformly high quality of performance . . . simplicity and ease of operation . . . low cost of production. But not many know that these advantages can also be realized—for wide varieties and *small quantities* of parts assigned to a CINCINNATI. How can it be done? There are two main considerations: 1) Group together all parts requiring a particular type of setup. You will eliminate frequent changes from thrufeed to infeed jobs. 2) Group all parts together by diameter. It takes less time to change the setup for a small difference in diameter than a large difference. ¶It will certainly be to your advantage to investigate CINCINNATI FILMATIC No. 2 Centerless Grinders for a wide range and small quantities of parts. A more complete story of economical small parts production may be obtained by writing for "Principles of Centerless Grinding," publication No. G-503-2.



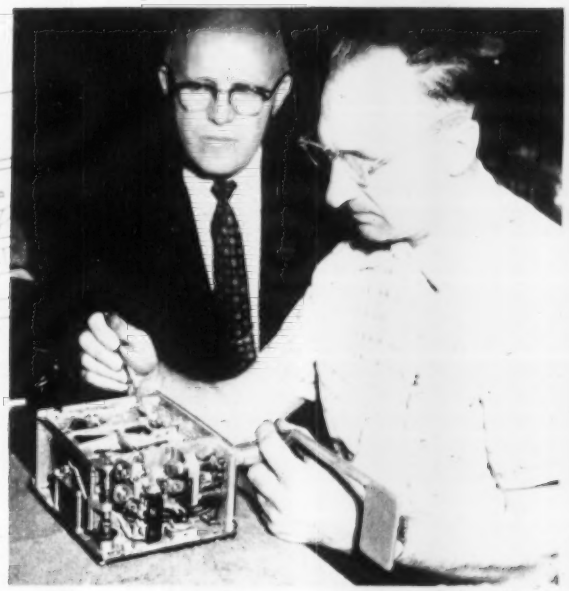
CINCINNATI FILMATIC No. 2 Centerless Grinder. Catalog No. G-611-1 contains complete specifications. Copy sent on request.

CINCINNATI GRINDERS INCORPORATED
(Subsidiary of The Cincinnati Milling Machine Co.)
CINCINNATI 9, OHIO

FILMATIC

CINCINNATI

CENTERTYPE GRINDING MACHINES • CENTERLESS GRINDING MACHINES • CENTERLESS LAPPING MACHINES • MICRO-CENTRIC GRINDING MACHINES



Rockwell Mfg. Co.

Taximeters: Accountants on Wheels

Some nine makers are turning out about 5000 units a year. Of the nation's 100,000 cabs, 60,000 use the device. Manufacturers seek to broaden markets

A PRECISION INSTRUMENT built for rough service, taximeters are ticking off improving sales figures for producers. The business outlook is better yet, say most of the nine manufacturers.

"More cities are specifying meters for their taxicabs, as they realize advantages of precision calculation over the zone method of determining fares," remarks Ralph K. Ulrich, vice president, sales, of Rockwell Mfg. Co.'s Register Division. That Pittsburgh company produces the Ohmer taximeter.

Postwar Sales—"Best years for taximeter production followed World War II, when many small taxicab companies were formed," say officials of U. S. Taximeter Co., New York. Sales now are estimated at about 5000 meters annually.

With taximeters built to give 25 years of dependable operation under extreme traffic conditions, producers concentrate on developing new markets, rather than depending on replacement. And most producers, like Viking Tool & Machine Corp., Belleville, N. J., have several other product lines.

Sales Prospects — "Roughly 40 per cent of all taxicabs do not use meters to compute fares," reports L. Mandler, vice president, Pittsburgh Taximeter Co., Pittsburgh. Taximeter sales managers are aiming at that potential market among the 100,000 taxicabs now in operation.

That meter relentlessly computing your taxi fare is a durable, precise combination of 225 to 600 parts, manufacturers say. Price averages about $280. "The taximeter combines operations of a clock, calculating machine and speedometer," says Mr. Mandler. The clock records waiting time while the calculating machine computes your fare.

Easy To Assemble—Assembly of meters is simplified for economy and interchangeability of parts. Most specifications are determined by local ordinances. "Any functional part of the Ohmer meter can be removed by the operator and replaced in the field without removing side frames," Mr. Ulrich says.

For maximum meter life and protection against manipulation, the selection of metals used in taximeters is extremely important. Gears may be made of bronze or hardened steel, according to the application. Providing maximum resistance to wear, bearings in frames and base of the meter are bronze. Hardened steel in cams and levers can furnish rigidity needed for accurate and permanent adjustment with long life.

Use of Aluminum — "In the Ohmer meter, mounting shafts must be strong enough to resist distortion, insuring functional freedom of working parts after installation," Mr. Ulrich reports. "All precision parts are mounted between heat treated aluminum frames and set on a rigid tempered aluminum base."

Guarantees against tampering are built into each mechanism. Counters are covered with hardened steel or insulated glass for this purpose. A welded steel cabinet then covers the mechanism. Meters are sealed so they can't be changed without knowledge of a city inspector.

Long Life—Combination of durability and accuracy brings dependable performance in the taximeter. "Meters will perform accurately for at least ten years with minimum maintenance and under hard usage," says Mr. Ulrich. "The average cab makes 45 pay trips a day and travels 180 miles. The taximeter is working during about 35,000 of the 65,000 miles driven each year. Thousands of Ohmer meters are in use today which are over 25 years old."

Renegotiation Deadline Extended

The Renegotiation Board has extended until further notice the time for contractors having a fiscal year ending in 1954 to file required financial statements. Notice of the extended date will be given after Congress has completed legislation amending and extending the Renegotiation Act.

Make it WEIGH LESS ...

and LAST LONGER

You can design light weight, longer life, and economy into your products by including N-A-X HIGH-TENSILE in your plans.

It is 50% stronger than mild steel.
It is considerably more resistant to corrosion.
It has greater paint adhesion with less undercoat corrosion.
It has high fatigue life with great toughness.
It has greater resistance to abrasion or wear.
It is readily and easily welded by any process.
It polishes to a high lustre at minimum cost.

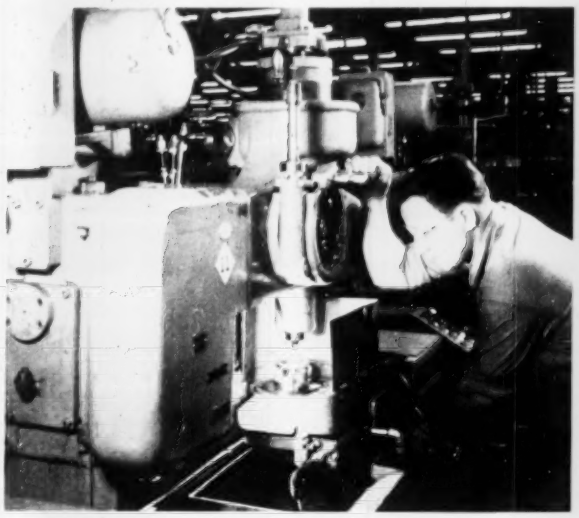
And with all these physical advantages over mild carbon steel—it can be cold formed as readily into the most difficult shaped stamping.

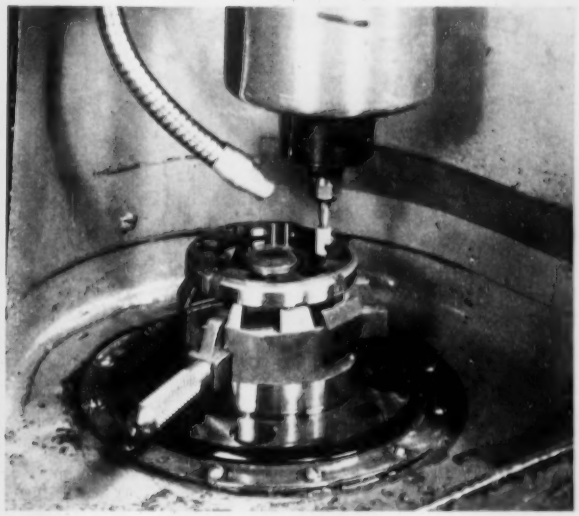
Sound like something for you? Ask for full facts and think of N-A-X HIGH-TENSILE when your redesign.

GREAT LAKES STEEL CORPORATION

N-A-X Alloy Division — Ecorse, Detroit 29, Michigan

NATIONAL STEEL CORPORATION





Imagination, air turbines and Fellows grinders team up to demonstrate . . .

How Engineering-Production Teamwork Pays at Chevrolet

DETROIT ENGINEERS and production men traditionally look upon one another with a degree of respect approaching pure pity.

Because of auto company volume, there are no small mistakes and no small savings. Only a penny saved is about $15,000 earned. And with incessant model changes and product development projects, that "make it"—"it can't be made" relationship must metamorphose into co-operation.

How Chevvy Does It—It's no secret in the auto industry that you've got to go some to out-click Chevrolet. Yet by virtue of its size and volume, Chevrolet has the biggest co-ordination hurdle of all. That's why those attending the SAE meeting in Chicago recently were particularly interested in the paper by Edward N. Cole and Edward H. Kelly on "The Engineering and Production Team."

To begin at the beginning, final approval for a new major program cannot be obtained from management "before or later" than 21 months before the start of production. This gives management a chance to observe competitive trends and forecast the new model requirements more accurately. But once approval has been given, building of experimental models, testing, production design, production tooling, design check and purchasing of material are all done concurrently.

Expect the Unexpected—This program would be merely excruciatingly complex if everything went according to plan, but it never does. The experimental models usually show up with bugs in the design which must be corrected. After the designs are studied by production, it is often found that the design can be made more easily or economically if changes are made.

Enter the production engineer who probably was originally a design engineer that stopped to listen to what a production man had to say or vice versa. Chevrolet has several hundred people in its production engineering department who have the responsibility of adapting designs for production requirements and integrating engineering and production activities.

The Beginning—Actually, the duties of the production engineer begin before the design has been released. In the first stages of design, he consults the production people on a number of matters which affect the utility of the design such as tooling. Before the design engineer devotes too much time to the design he must know how much tooling it will require, how much it will cost and how soon it can be obtained.

Not only can tool costs be cut by minor changes in design quite frequently, but the purchase of new machines may be obviated. Forging may seem the most economical way of producing a given design, for example, but if the forging shops are loaded with jobs new facilities would have to be purchased. Rather than do that, production might suggest that design be changed to a stamping when it has idle stamping capacity.

What To Look for—Other things the production engineer looks for in his investigation of the prints are dimensional tolerances too close to be held on production machines, tolerances too broad to insure a satisfactory field product,

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or specified assembly and gaging methods which should be changed to insure a better product and effect economies. Another of his concerns is to see that a proper selection of materials has been made.

If his investigation should uncover the need for a change, the production engineer has full authority to issue a change notice as long as the design or function is not vitally affected. Changes are verified by tests and production engineering has extensive testing facilities and is building more at Chevrolet. This helps provide answers to the questions: "Can it be made better?" "Can it be made easier?" "Can it be made at lower cost?"

Case Study—An interesting example of accomplishments of this group involves a design which engineering had no idea how to produce. The "impossible" part was an overrunning clutch cam surface which engineering asked production to finish to within 0.0002 inch of parallel. Engineering realized this was an unreasonable request because no tool manufacturer would build a machine which could finish the surface closer than 0.0015 inch of parallel. On the other hand, the tolerance was critical to the good operation of the Powerglide transmission.

The master mechanic set about creating a machine which would do the job. The rest of the industry was using a broach to finish the cam surface since the cam presented only limited access. Grinding was an alternative, but there was only room for a 5-16-inch grinding wheel. To drive that wheel at the required surface speed, tremendous velocities were needed.

Solution — The problem was solved. A Fellows grinder was obtained. For the regular drive, which was much too slow, an air turbine was substituted which drove the wheel at 65,000 rpm. The design was then refined until a machine was produced which would stroke, index and describe the curve on the cam surfaces all automatically. And as a final touch, an automatic device to dress the grinding wheel was added. Today 25 such machines are in use, essentially the same as the prototype developed through engineering-production co-operation.

Auto, Truck Output

U. S. and Canada

	1954	1953
January	594,789	614,069
February	573,821	628,917
March		752,474
April		782,453
May		685,390
June		713,206
July		757,595
August		641,152
September		605,228
October		651,153
November		457,852
December		529,588
Total		7,818,168

Week Ended	1954	1953
Mar. 6	139,263	158,825
Mar. 13	143,478	165,762
Mar. 20	154,895	169,923
Mar. 27	149,562	181,749
Apr. 3	143,299	170,567
Apr. 10	147,000*	176,782

Source: Ward's Automotive Reports
*Estimated by STEEL

Another area which gets a great deal of production engineering attention is the assembly plant. If sufficient time and effort are given when new parts are designed, they can be put together better and more economically. The point is not whether two parts will go together, but how quickly they can be put together properly. Similarly, more attention is being given to standardization of parts and the elimination of unnecessary parts.

Co-operation — This information can only be gained by an engineer who knows what goes on within an assembly plant by actually spending time with their problems. While it is true that design sets up minimum basic costs beyond which only minor savings are possible, it is also true that production can determine the mode of design.

Thus it is that the buffer boys, the production engineers, contribute so much to the production of good design at the lowest cost.

Car of the Week

First "car of the week" for 1954 is the Plymouth.

The problem is that the Plymouth is still low horsepower of a different color. With Hy-Drive, stepping on the accelerator was like shoving your foot into a bucket of yoghurt. With Power-Flite, Plymouth moves up into the creamed cheese class but only at room temperature. It'll take the Dodge treatment to cure Plymouth traffic light brushoff, and reportedly Plymouth will be getting a scaled-down Dodge engine to do just that.

Perhaps the most outstanding thing about the Plymouth on the road is its superb ride. This little color carnival rides like a heavyweight and probably offers more in that department than anything in its field. Concomitant with its ride, however, is a rather unusual cornering sensation until you get used to it. When you enter the corner, the car assumes a rather pronounced lean indicating the worst is yet to come. But nothing comes. Having satisfied its centrifugal impulses, the car understeers its way on around the bend in acceptable shape.

Retained from last year are the intelligently sensitive steering ratio and short turning radius which make the car extremely maneuverable.

Also retained are the centrally positioned glove compartment and good visibility which marked last year's models, together with an uncluttered dash to minimize damage to small heads in sudden stops. In one of those moves difficult to fathom, the one small ash tray next to the steering post where it was inconvenient to the passenger has been moved this year. Now it's on the right side convenient to the passenger and inconvenient to the driver.

But be that as it may, the continued high use of Plymouths in rugged taxi service bears mute testimony that you'll shop a long while before you find a more rugged and economical transportation piece.

Exhaust Notes

A removable plastic top for the Chevrolet Corvette will shortly be offered comparable to the unit to be available for the Thunderbird. In effect it will give the car the appearance of a hard-top and can be removed in summer.

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*Gears over 30" diameter are protected by copper colored water soluble paint which need not be removed before placing in service

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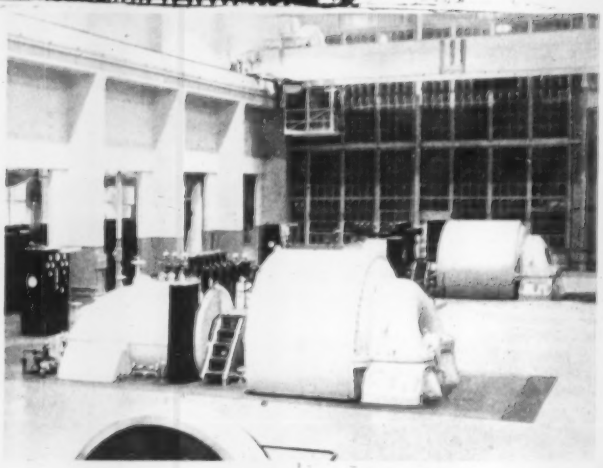

Two of the four Ingersoll-Rand Turbo-Blowers installed in the furnace blowing room of the Kaiser Fontana Steel Plant.

Ingersoll-Rand Turbo-Blowers driven by I-R Steam Turbines and served by I-R Surface Condensers, Air Ejectors and Condensate Pumps

It takes a lot of air to keep the blast furnaces burning at the huge Kaiser plant. And *all of it* is supplied by Ingersoll-Rand Turbo-Blowers.

The I-R blower equipment at the Fontana Plant includes two 100,000 cfm and two 75,000 cfm steam turbine driven Turbo-Blowers, each served by I-R rectangular surface condensers, steam-jet air ejectors and condensate pumps. These complete I-R Blower Plants, with all elements designed to work together as a unit, provide the *maximum dependability* for continuous heavy-duty service, year after year.

When it comes to blast furnace blowing, Ingersoll-Rand's experience is unequalled. That's why I-R blast furnace turbo-blowers are first choice in America's steel plants. Your nearest Ingersoll-Rand engineer will be glad to tell you more about I-R turbo-blowers. Ask for your copy of catalog 8258.

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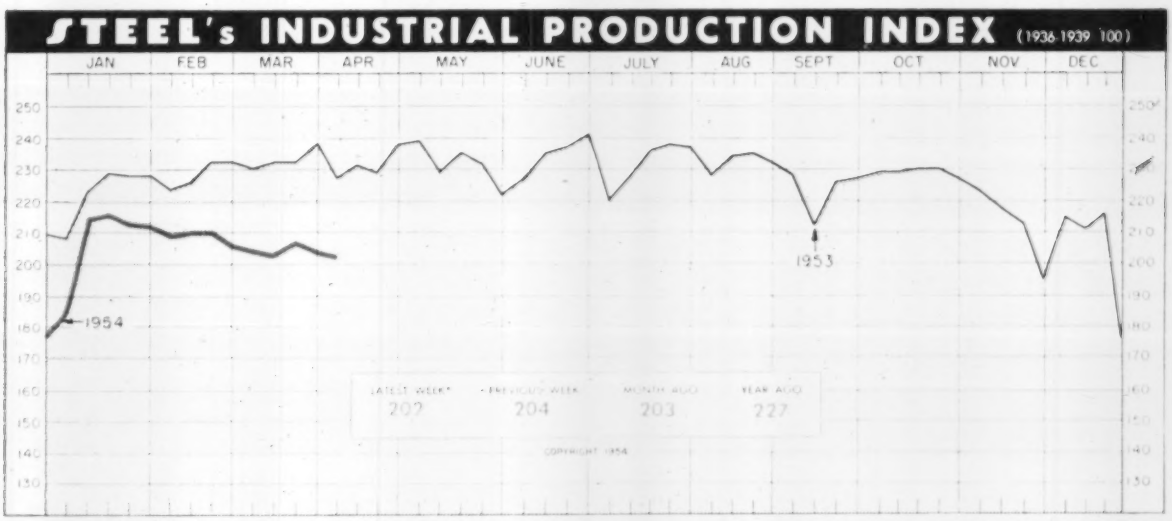


* Week ended Apr. 3

Production Index Follows March Pattern

INDUSTRIAL PRODUCTION for April, as measured by STEEL's index, is getting off to the same kind of a start as it did in March, and businessmen are hoping that is the end of the similarity between the two months. Industrially, March came in like a lamb and left without the least sign of turning into a roaring lion. But to date there still is no definite sign of an upturn, and the leveling-off pattern set in March could be repeated in April.

The index for the week ended Apr. 3 registered 202 per cent of the 1936-1939 average, just 1 percentage point below the level of a month ago. The decline of 2 percentage points from the previous week's reading is laid at the feet of the auto industry, which, strangely enough, is one of the most dynamic segments of industry at the present time. Production of 135,107 cars and trucks for the week ended Apr. 3 was about 1000 units below the previous week, says *Ward's Automotive Reports*. While other segments worry about when orders and sales are going to turn up, the automakers bolt ahead with heavy production schedules in anticipation of sales which are "just around the corner."

Close Race for Third . . .

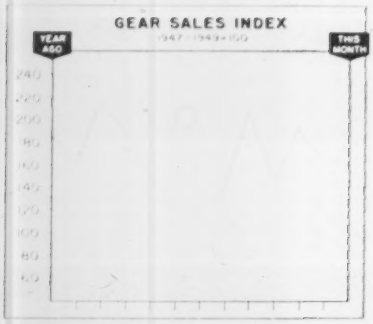
The pattern within the auto industry has taken some interesting turns so far this year. The past has been noted for the consistent ranking of Chevrolet, Ford and Plymouth, in that order, in both production and sales. But for first quarter, 1954, it appears that Ford has taken over No. 1 spot and Buick, a premium-priced car, has ousted Plymouth from No. 3 position in production. Sales figures so far are inconclusive, but Buick officials claim third position there, too. This may be indicative of the changing trend in the consumers' buying habits toward more higher-priced automobiles. It certainly has had its influence on the lower-priced auto manufacturers, because they continue to push their higher-priced models.

One of the big reasons total production in the automotive industry is lagging behind last year's figures can be found in trucks. While passenger cars are down only 8 per cent, trucks are off 17 per cent. The January-March pace of trucks was the slowest since 1946, *Ward's* says. The 300,000th truck of 1954 rolled off the assembly line on Apr. 6. A year ago the date for that event was Mar. 23.

Up-again, Down-again Steel . . .

Helping to offset somewhat the effect of the auto decline, steel operations made a slight comeback to 69 per cent of capacity during the week ended Apr. 4. However, the American Iron & Steel Institute estimated production for the week ended Apr. 11 would slip again to about 68 per cent of capacity. That would be 1,626,000 net tons of ingots and steel for castings.

On the West Coast, Bethlehem Pacific Coast Steel Corp. gives an indication that business may be getting better. Incoming orders have increased each month since the beginning of the year, H. H. Fuller, president, says. The company's March shipments were at the highest level since last October. He explains that his company's operating rate dropped off last fall before the decline started in eastern mills. If the pattern holds, it may mean a pickup in



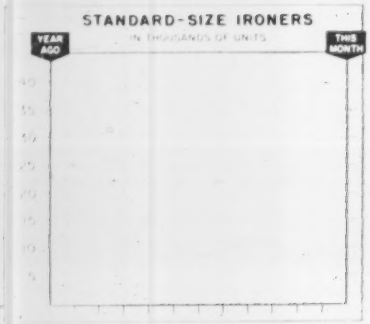
Gear Sales Index

(1947-1949=100)

	1954	1953	1952
Jan.	167.4	161.3	670.6*
Feb.	166.1	188.1	55.6*
Mar.		158.9	517.1*
Apr.		217.1	478.7*
May		189.8	425.9*
June		146.5	452.3*
July		120.7	145.3
Aug.		121.6	132.3
Sept.		135.6	143.4
Oct.		211.1	160.8
Nov.		143.9	156.9
Dec.		194.0	146.9

*(1952: 1939=100)

American Gear Manufacturers Assn.

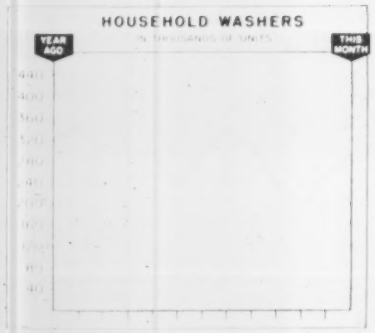


Standard-Size Ironers

Factory Sales—Units

	1954	1953	1952
Jan.	9,792	24,395	15,636
Feb.	8,208	22,586	17,630
Mar.		16,066	13,913
Apr.		14,050	8,938
May		9,323	12,642
June		12,529	17,564
July		9,626	15,024
Aug.		8,067	16,477
Sept.		9,113	22,492
Oct.		11,666	25,204
Nov.		10,165	19,724
Dec.		6,998	16,798
Total		154,161	202,143

American Home Laundry Mfrs. Assn.

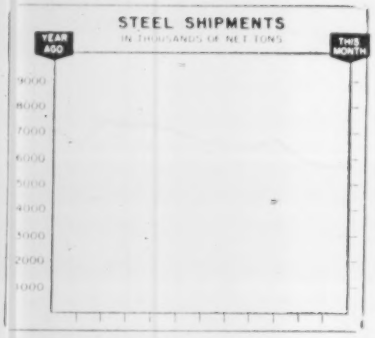


Household Washers

Sales Billed—Units

	1954	1953	1952
Jan.	219,956	277,309	213,998
Feb.	256,171	326,504	256,864
Mar.		345,989	248,431
Apr.		288,474	247,211
May		286,515	213,668
June		304,096	274,457
July		228,268	207,462
Aug.		291,260	234,537
Sept.		340,532	283,732
Oct.		310,867	327,814
Nov.		238,153	293,079
Dec.		191,579	310,661
Totals		3,429,627	3,191,044

American Home Laundry Mfrs. Assn.



Steel Shipments

Net Tons

	1954	1953	1952
Jan.	7,727,000	7,067,636	6,589,190
Feb.		6,533,227	6,358,293
Mar.		7,436,919	6,890,391
Apr.		7,162,460	5,922,173
May		7,209,396	5,947,436
June		6,950,959	1,250,243
July		6,582,513	1,413,672
Aug.		6,478,665	6,312,118
Sept.		6,400,757	6,542,147
Oct.		6,726,850	7,155,611
Nov.		5,903,980	6,647,725
Dec.		5,084,929	7,105,382

American Iron & Steel Institute

Charts Copyright 1954 STEEL

Issue Dates on other FACTS and FIGURES Published by STEEL

Construction	Feb. 22	Gray Iron Castings	Mar. 15	Ranges, Elec.	Mar. 29
Durable Goods	Mar. 22	Index, Production	Mar. 29	Ranges, Gas	Mar. 22
Employ., Metalwk.	Apr. 5	Machine Tools	Mar. 8	Refrigerators	Mar. 29
Employ., Steel	Mar. 8	Malleable Castings	Mar. 15	Steel Castings	Mar. 15
Rail, Strct. Steel	Mar. 1	Prices, Consumer	Mar. 22	Steel Forgings	Mar. 8
Foundry Equip.	Apr. 19	Prices, Wholesale	Apr. 5	Vacuum Cleaners	Apr. 5
Freight Cars	Feb. 22	Pumps	Mar. 15	Wages, Metalwk.	Mar. 1
Furnaces, Indus.	Feb. 8	Radio, TV	Mar. 29	Water Heaters	Mar. 22

business is in store for the East soon.

Future Prospects Dim . . .

If there is to be a pickup in business, don't look for it in freight car loadings. Estimates compiled by the 13 regional Shippers Advisory Boards indicate that loadings for second quarter will continue to decline and will fall beneath a like period in 1953 by 7.6 per cent. Through the week ended Mar. 27, car loadings for revenue in 1954 trailed the same period in 1953 by over 1 million cars. The boards had predicted a 1.4-per-cent drop in first quarter from the like quarter a year ago, but in the first 12 weeks of the period the decline was actually 11.4 per cent.

Railroad profits have reflected the sharp cut in business, too. Estimated income of 130 Class I railroads in February, after interest and rentals, was $21.5 million compared with $56 million in February, 1953, according to the Association of American Railroads. Net income for the first two months of 1954 was $40 million compared with a net of $114 million for the corresponding period of 1953.

A Drop in the Bucket . . .

Unemployment seems to be leveling off, the Department of Labor reports. From mid-February to mid-March, only 54,000 were added to the nation's list of unemployed. Compared with the increase of 584,000 for the previous month to mid-February that is a drop in the bucket. On the other hand, 60.1 million persons had jobs in March, an increase of 45,000 over February. The simultaneous increases were made possible by the addition of about 100,000 persons to the calculated labor force—the total of people willing and able to work.

Incurable Optimists . . .

There continues to be enough optimism in business circles to keep a rosy tinge on any business forecast. In a survey conducted by Dun & Bradstreet-Inc., businessmen who believe net sales in second quarter, 1954, will top net sales of second quarter, 1953, outnumbered by three to two those who

BAROMETERS OF BUSINESS

	LATEST PERIOD	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,621	1,624	2,196
Electric Power Distributed (million kwhr)	8,463	8,491	8,019
Bitum. Coal Output (daily av.—1000 tons)	1,113	1,125	1,394
Petroleum Production (daily av.—1000 bbls)	6,400[1]	6,452	6,341
Construction Volume (ENR—millions)	$329.5	$283.6	$344.1
Automobile, Truck Output (Ward's—units)	143,299	149,562	170,567
TRADE			
Freight Car Loadings (unit—1000 cars)	595[1]	601	705
Business Failures (Dun & Bradstreet, no.)	267	277	171
Currency in Circulation (millions)[3]	$29,701	$29,632	$29,754
Dept. Store Sales (changes from year ago)[4]	-11%	-13%	+11%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$17,957	$20,426	$18,128
Federal Gross Debt (billions)	NA	$270.5	$264.5
Bond Volume, NYSE (millions)	$15.7	$16.8	$14.3
Stocks Sales, NYSE (thousands of shares)	10,785	9,167	9,826
Loans and Investments (billions)[4]	$79.2	$80.8	$77.8
U. S. Gov't Obligations Held (billions)[4]	$31.6	$32.8	$30.7
PRICES			
STEEL's Finished Steel Price Index[5]	189.74	189.74	181.31
STEEL's Nonferrous Metal Price Index[6]	212.5	208.6	230.5
All Commodities[7]	110.9	110.8	110.0
Commodities Other Than Farm & Foods[7]	114.4	114.4	113.4

[1]Dates on request. [2]Preliminary. [3]Weekly capacities, net tons: 1954, 2,384,540; 1953, 2,254,450. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939—100. [6]1936-1939—100. [7]Bureau of Labor Statistics Index, 1947-1949—100. NA—Not Available

believed there will be a decline. More than one-fourth of those queried said they saw no change in sales between the two quarters. Manufacturers of nondurable goods were more optimistic than durables producers.

In partial support of that survey is the word from the Office of Business Economics that while manufacturers' shipments in February were a little under the January rate, new orders improved by about $1 billion on a seasonally adjusted basis. Most of the increase was in nondurable goods. Combine that with the fact that buying policies, as reported by the Purchasing Agents Association of Chicago, are still largely in the 30-60-days-or-more range and it is possible that the increased orders will show up in April or May production figures.

Heavy Construction Goes Up . . .

As spring sets in, heavy construction sets in, too. *Engineering News-Record* reports that new awards for heavy construction in the week ended Apr. 1 amounted to $330 million, the highest weekly total of the year. The upsurge closed the gap between current and year-ago figures from 41 per cent below at the end of February to only 31 per cent below at the end of March. Awards total $2.8-billion for the first 13 weeks of this year compared with slightly over $4 billion during the same period last year. Aberthaw Co., construction managers in Boston, reports the cost of industrial construction advanced slightly in the first quarter from 392.2 on Dec. 31 to 393 on Mar. 31, based on 1914 as 100.

Trends Fore and Aft . . .

Don't expect a rush for color TV sets even though Westinghouse did cut its prices all the way from $1295 down to $1110 . . . Revere Copper & Brass will diversify its product line with more than 60 copper-clad stainless steel utensils for hospitals, school cafeterias, hotels and other institutions . . . American Steel Foundries will close its East St. Louis, Ill., plant Apr. 16 because of lack of orders . . . James J. Nance, president of Packard Motor Car Co., says, "There are definite signs of a sound business upturn, with it being shown most strongly in the southern part of the country where seasonal sales patterns normally are seen early."

Which kind of Cold Rolled Strip Steel is best for You ?

CONSIDER SHEET COIL

—if variations in physical characteristics are permissible.
—if fairly heavy oversize gauge variations are not objectionable.
—if the fabricating operations are not too complicated and do not require intricate expensive dies.
—if a fine surface finish is not essential.
—if a good base for paint or enamel is desired.
—if you do not object to some "square footage" loss due to oversize variation.
—then Sheet Coil will probably be the most economical material for the job.

CONSIDER THINSTEEL

—if you must have a high degree of uniformity of chemistry and physical properties—and precision gauge tolerances.
—if you wish to keep die wear low, no oversize gauge variations.
—if you require a fine finish or a better base for plating.
—if you want maximum yield for "most finished parts per ton."
—if you want selected tempers for maximum strength and lightest weight.
—then you'll find Thinsteel the most economical material by far.

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You can always count on Kenilworth helping you get the right steel for your requirements. Order Sheet Coil or Thinsteel and notice that each coil carries an identifying tag as pictured above. Call on Kenilworth, too, for your needs in Stainless Sheets or flat rolled Spring Steels (Annealed or hardened and tempered).

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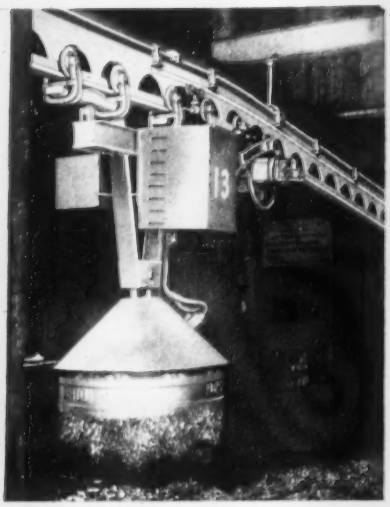
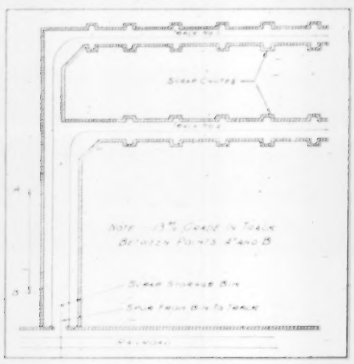


View of tracks near beginning of tunnels. Carrier is shown approaching track incline on way to bin with a load.

A load of scrap about to be dropped in bin. Carrier immediately reverses after unloading and starts another trip.



ONE carload of metal chips and shavings is picked up and moved daily with an automatic Cleveland Tramrail magnet-carrying system that operates unattended in two parallel tunnels under metal-working machines.

Each tunnel has its own Tramrail track on which a magnet carrier travels back and forth, picking up scrap that comes down from the machines on floor above. The scrap is conveyed to a bin next to a railroad siding. The system was put into operation in 1942 and has proven an extremely efficient and low-cost method for ferrous scrap disposal.

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OVERHEAD MATERIALS HANDLING EQUIPMENT

GLENN C. LECHLEITNER
. . . gen. mgr. at Cleveland Punch & Shear

G. A. PROFITA
. . . a reg. mgr. for B&W's boiler division

M. C. PETERSON
. . . Warner Electric automotive sales mgr.

Glenn C. Lechleitner was made general manager of **Cleveland Punch & Shear Works Co.**, Cleveland. Associated with the company four years, he previously held the posts of sales engineer and sales manager.

J. H. Stillbach, president of Allied Products Corp., Dorchester, Mass., was elected president and a director of **LaPointe Electronics Inc.**, Rockville, Conn. **Jerome E. Respess** resigned as president and was made vice president in charge of sales. **Milby M. Hancock** was named assistant secretary and assistant treasurer.

Richard A. Modig, general sales manager, **Holo-Krome Screw Corp.**, Elmwood, Conn., was elected vice president-sales. **William J. Basile** was made treasurer.

Graham H. Anthony, chairman of the board of **Veeder-Root Inc.**, Hartford, Conn., was elected chairman of the executive committee. **John H. Chaplin**, president, was named chairman of the board of directors and is succeeded as president by **Harvey L. Spaunburg**, former executive vice president.

Globe Steel Tubes Co., Milwaukee, promoted **Norman E. Wenzel** from superintendent of industrial engineering to manager of plant operations. He is succeeded by **Eugene J. Kub**.

G. A. Profita was named regional manager, manufacturing department, at **Babcock & Wilcox Co.'s** boiler division, New York. He was previously co-ordinator of manufacturing and production activities at the Wilmington, N. C., and Brunswick, Ga., plants. In his present position his work embraces these plants in addition to those at Alliance, O., West Point, Miss., and Paris, Tex.

New works manager for **Pheoll Mfg. Co.**, Chicago, is **J. D. Goodall** who replaces **D. C. Eisendrath**, resigned.

Hugh Glen was elected president of **Johnston Pump Co.**, Pasadena, Calif. He formerly was president of Emsco Derrick & Equipment Co. He succeeds **Mrs. Thomas W. Simmons** who has resigned as president but is still sole owner of the firm.

At **New Britain Machine Co.**, New Britain, Conn., **Ralph S. Howe** succeeds **Robert T. Frisbie** as president. Mr. Frisbie was elected chairman of the executive committee. **Julian C. Pease**, who continues as general manager, New Britain Gridley Machine Division, was elected vice president. **Clarence E. Bachman** becomes vice president in charge of the products division and **George G. Wilcox** vice president-hand tool division.

M. C. Peterson was named automotive sales manager, **Warner Electric Brake & Clutch Co.**, Beloit, Wis. Well known in the automotive industry, he formerly served as regional sales manager for Willys-Overland Motors Inc. and vice president of Flex-O-Tube Co. He joined the Warner staff as Chicago district manager, automotive division, in 1951. Prior to his new appointment he was manager of national account sales.

Coast Metals Inc., Little Ferry, N. J., elected **George S. Mikhalapov** president to succeed **John P. Rutherfurd**. Previous to World War II, Mr. Mikhalapov served Taylor-Winfield Corp. in Warren, O., as director of research and development. Following the war he joined Air Reduction Co. as manager of its apparatus research department. In 1951 he became affiliated with General Electric's Knolls Atomic Power Laboratory.

Harmon S. Eberhard was elected president, **Caterpillar Tractor Co.**, Peoria, Ill., and **Louis B. Neumiller** was elevated to chairman of the board. Mr. Eberhard was executive vice president and previously served as vice president of engineering and manufacturing.

Dravo Corp., Pittsburgh, appointed **Arthur W. Gulliver** to its New York office staff as application engineer.

JOHN WRIGHT JR
joins Oldham-Rust Co. sales force

J. H. BEARDSLEY
Bryant Chucking Grinder exec. v. p.

D. H. GARDNER
Sunbeam's industrial furnace gen. mgr.

to handle the sale of fabricated piping.

John Wright Jr., formerly with Rosan Inc., was appointed manager of industrial sales for **Oldham-Rust Co. Inc.**, manufacturers' representative, New York. He will concentrate efforts on behalf of Townsend Co., New Brighton, Pa., manufacturer of rivets, nails and similar products and will be assisted by **C. E. Eggers** and **E. S. Miller**.

Milton J. "Tex" Wurzbach was made assistant director of public relations for the Cleveland district of **United States Steel Corp.** He succeeds **Alvin L. Krieg**, now director of public relations in the Utah-Intermountain district.

J. Harrahill was named plant manager and **F. K. Richardi** assistant plant manager of the newly completed factory on the outskirts of Lancaster, Pa., constructed by **Permutit Co.** Mr. Harrahill has been serving the subsidiary company, Simplex Valve & Meter Co., Philadelphia, as plant manager. Mr. Richardi joined Permutit in January, 1952, as assistant plant manager of the Brooklyn, N. Y., plant, a position formerly held by Mr. Harrahill.

Simplex Valve & Meter Co., Philadelphia, subsidiary of Permutit Co., appointed **George L. Walker** district manager of its New York office.

J. H. Beardsley was elected executive vice president, **Bryant Chucking Grinder Co.**, Springfield, Vt. A director since 1946, he joined Bryant in 1948 after association with Jones & Lamson Machine Co. He has since served as assistant to the president, general manager and vice president. He is also president of E. G. Staude Mfg. Co. Inc., St. Paul, a subsidiary.

J. F. Schirtzinger was appointed president and general manager of **Consolidated Tool & Products Co.**, Los Angeles. He succeeds the late **Anthony Oberholtz**. Mr. Schirtzinger has been with Convair's San Diego, Calif., division.

J. F. SCHIRTZINGER
heads Consolidated Tool & Products

D. H. Gardner was appointed general manager of **Sunbeam Corp.'s** industrial furnace division, Chicago. Since 1946 he served the division as Detroit district sales manager. **J. T. Williams** was assigned to the Detroit area and **L. B. Canfield** to the Philadelphia area. **L. W. Prestin**, former vice president and division general manager, was elected vice president of Sunbeam's subsidiary at Toronto, Ont.

Jack Saunders was made manager of a new sales district of **Anaconda Wire & Cable Co.** which includes all of Florida with sales office in Tampa. **Robert W. Carmichael** will work with Mr. Saunders in the new location. **Frank D. Dickey** was made manager of the San Francisco district to succeed **Lee Hayward**, resigned.

John W. Spoor was appointed to the newly created post of assistant division manager, welding products division, **A. O. Smith Corp.**, Milwaukee. He is succeeded as general sales manager by **Richard W. Raney**.

Claude W. Mottinger, purchasing agent for the rubber division of **Hewitt Robins Inc.**, Buffalo, assumes the newly created position of purchasing director for the entire company.

J. H. Webber was made assistant manager of tubular products sales, general offices, Oakland, Calif.,

Composite photo of one torch and jet mixer with three different welding tips: 13, 7 and 1.
two new reasons
why the AIRCO 800 is the...
MOST VERSATILE TORCH YOU CAN BUY
2. NEW JET MIXER
1. NEW CUTTING ATTACHMENT

The Airco Style 800 torch will handle any welding, heating or cutting job, thanks to the brand new Airco Jet Mixer and two completely redesigned cutting attachments.

The new Jet Mixer gives you perfectly stable flame control with all gas flows. Cyclonic action swirls the gases together, mixing them completely, within a tip size range from 0 to 14 inclusive. Rubber gas sealing rings provide a gastight seal with hand tightening, no wrench required . . . saves time in tip changes.

New heavy-duty cutting attachment takes all standard tips; cuts steel up to 8" thick! Medium-duty attachment available for lighter service. Both have rubber gas sealing rings, plus mixers which can be easily removed for cleaning, if necessary.

Owners of Style 800 torches can use the new Jet Mixer and cutting attachments with their present torches. For details, write to Air Reduction or see your Airco dealer, asking for your copy of Catalog 818, "Hand torches for gas welding and cutting."

AIR REDUCTION

60 East 42nd Street • New York 17, N. Y.

at the frontiers of progress you'll find...

Divisions of Air Reduction Company, Incorporated, with offices and dealers in most principal cities

Air Reduction Sales Company
Air Reduction Magnolia Company
Air Reduction Pacific Company

Represented Internationally by
Airco Company International

Foreign Subsidiaries: Air Reduction Canada, Limited, Cuban Air Products Corporation

GLENN D. EASTON
Lovejoy Tool chief engineer

FRED J. WATT
Worthington air conditioning-refrig.

CHARLES W. LEDIG
sales mgr. for National Pneumatic

Kaiser Steel Corp. **T. H. Wakeman** was made mid-continent district sales manager, Tulsa, Okla.

Glenn D. Easton was made chief engineer for **Lovejoy Tool Co. Inc.**, Springfield, Vt., to succeed **E. B. Lucarini**, retired. Mr. Easton has served in the engineering department since joining the company in 1941.

Scott H. Hanville Jr. joined **Jack & Heintz Inc.**, Cleveland, as manager of technical sales, a newly created post.

Charles F. McCabe and **Joseph H. Famme** were appointed assistant chief engineers in the San Diego, Calif., division of **Consolidated Vultee Aircraft Corp.** They replace the late **N. W. Bouley** and **Joseph F. Schirtzinger**, who resigned.

Fred J. Watt was named manager of a newly combined section of **Worthington Corp.'s** air conditioning and refrigeration division at Harrison, N. J. It will be known as the central station and ammonia equipment section.

Hal P. Kibbey was appointed assistant vice president-sales, **United States Steel Supply Division**, U. S. Steel Corp., Chicago. He formerly was Chicago district manager of this warehousing division. **Clyde B. Colwell Jr.**, district manager, St. Paul, was promoted to district manager, Chicago. **Earl L. Simanek**, assistant district manager, Chicago, was promoted to district manager, St. Paul.

Charles J. Fellrath succeeds **Fred A. Thomson**, retired, as secretary of **Ford Motor Co.**, Detroit.

National Pneumatic Co. Inc. and **Holtzer-Cabot Divisions**, Boston, appointed **Charles W. Ledig** sales manager of the company's actuators and controls division.

Edward E. Goodwillie, assistant vice president-sales, **Bethlehem Steel Co.**, Bethlehem, Pa., since 1934, has retired. He is succeeded by **Sigmund L. Holverstott.**

Charles W. Harrison will serve as sales-engineer in the Houston district for **Ingalls Iron Works Co.** and its subsidiaries, Ingalls Shipbuilding Corp. and Ingalls Steel Construction Co.

Lloyd W. Ingles was named superintendent of **Colorado Fuel & Iron Corp.'s** new Allen Mine at Weston, Colo. He succeeds **H. D. Pinkney**, resigned. Mr. Ingles was superintendent of CF&I's Fredrick Mine.

OBITUARIES . . .

Harry A. Leigh, 68, executive vice president, treasurer and a director of **Seymour Mfg. Co.**, Seymour, Conn., died in Florida of a heart attack Mar. 28.

Walter E. Punsky, 62, vice president, **Baltimore Porcelain Steel Products Co.**, Baltimore, died Mar. 28 in Toledo, O.

Julian L. Fish, 61, general purchasing agent, **Otis Elevator Co.**, New York, died Mar. 30 in Florida.

William J. Aldridge, 61, works manager of **Foster Wheeler Corp.'s** plant in Wilkes-Barre, Pa., died Mar. 31.

Valentine Fina, 72, president and treasurer of **Milwaukee Valve Co.**, Milwaukee, died Mar. 30.

Fred S. Markert, 53, executive vice president, **Ferro Corp.**, Cleveland, died Mar. 29.

John J. Prehler, 69, president of **Kondu Corp.**, Erie, Pa., died Mar. 26.

Harold K. Hennessey, 67, purchasing agent at the Bond plant of **American Radiator & Standard Sanitary Corp.**, Buffalo, died Mar. 26.

Dan M. Rugg, 64, vice president, **Koppers Co.**, Pittsburgh, in charge of the chemical division, died Mar. 28.

David M. Galloway, 74, former vice president, **Dominion Wheel & Foundry**, died Mar. 25 in Toronto, Ont.

L. J. Fitzpatrick, 76, retired president, **Tonawanda Electric Steel Casting Corp.**, North Tonawanda, N. Y., died Mar. 29.

Don't wait... Investigate the

Kearney & Trecker

TOOL-LEASE

PROGRAM

Here's a common sense approach to your plant modernization program

It's the most significant opportunity ever offered users of milling machines and precision boring machines

In these times, modernization is the soundest approach to meeting increasingly competitive conditions. And the best way to modernize — to improve products, cut costs, gain productive flexibility — is to retool with new machines. Today, Kearney & Trecker's new Tool-Lease Program offers you an unmatched opportunity to "junk the clunkers" that are nibbling away at your profits. It's time to act. Don't wait — investigate!

These are only a few of the advantages Tool-Lease offers you

You can try out new machines in your own plant . . . without being obligated to purchase them. You can get hitherto impossible flexibility and capacity to take advantage of changing production requirements without risk of obsolescence. Last, but not least, you can expand production without tying up working capital, going into debt, or impairing future borrowing capacity.

Tool-Lease helps you get the exact milling or boring machines you need

Under Tool-Lease, you can rent any Kearney & Trecker standard knee or bed type milling machine or precision boring machines. If you require special machinery or heavy-duty CSM bed-types, special agreements will be considered.

Three basic plans give you varying options to continue or terminate the lease or purchase the equipment.

For complete details on Tool-Lease . . . help in analyzing your milling and precision boring needs — see your Kearney & Trecker representative or mail coupon to Kearney & Trecker Corp., 6784 W. National Ave., Milwaukee 14, Wis.

THE CRITICAL PICTURE OF CREEPING OBSOLESCENCE . . . AND HOW TO STOP IT!

Let's take a typical basic industry as an example — Agricultural equipment. Of the 5235 standard knee type horizontal, vertical, bed and manufacturing milling machines and precision boring machines in use today — *which could be replaced by Tool Lease equipment* — 26% are 10-20 years old, 19.9% are more than 20 years old.

© 1954

Kearney & Trecker Corporation
6784 W. National Ave., Milwaukee 14, Wis.

Please send me Bulletin TL-10A with details on the Tool-Lease Program. ☐ Check here if you would like to have a representative call on you as soon as possible (or call Milwaukee, GReenfield 6-8900).

Name _____

Title _____

Company _____

Address _____

City _____ Zone _____ State _____

STEEL TUBING SEAMLESS, WELDED AND BUNDYWELD

ALL SIZES NOW AVAILABLE FOR IMMEDIATE DELIVERY

AVAILABILITY
UNIFORM HIGH QUALITY
LOWEST POSSIBLE COST

We carry one of the most complete stocks of tubing in the country in our Warehouses. Manufacture is under careful control from laboratory inspection of the raw material to the finished tubing, with the result that our product is of a uniformly high quality.

In order to provide the most suitable tubular product for the desired application at the lowest possible cost, we give specialized attention to fitting the tube to the job. The knowledge gained from our experience, acquaintance with the products of different mills, and the advantages and limitations of various tubular products is available to solve your tubing problems.

Lapham Hickey Co.

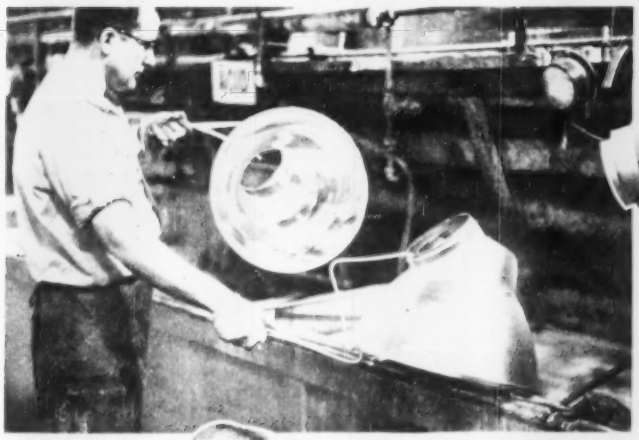
3333 WEST 47th PLACE, CHICAGO 32, ILLINOIS • PHONE VIRGINIA 7-0822
DETROIT, CINCINNATI, MILWAUKEE, ST. PAUL, ST. LOUIS, LOS ANGELES, ROCKFORD
INDIANAPOLIS, DAVENPORT, FORTWAYNE, AKRON, CLEVELAND, DENVER, DALLAS

GE floodlights illuminate the Yankee Stadium

Aluminum blanks for sports floodlight reflectors are squeezed into shape on Hydroform press

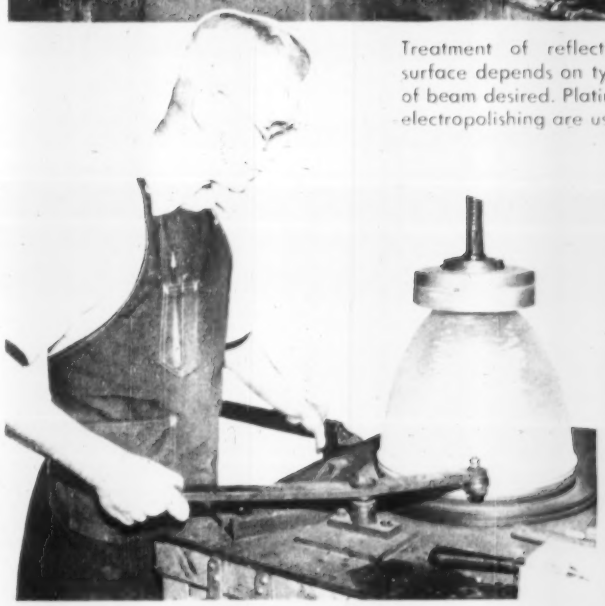
Aluminum Brightens the Night

General Electric's River Works, Lynn, Mass., turns out floodlights to make night baseball games daylight-bright

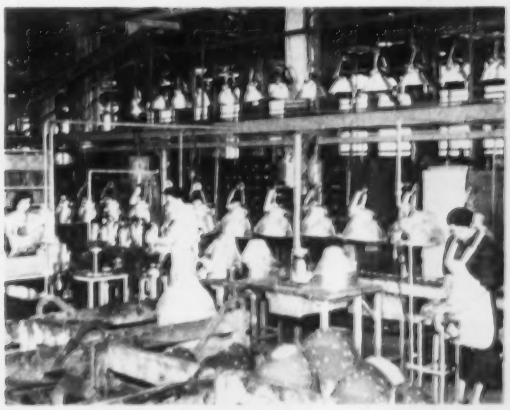


Treatment of reflective surface depends on type of beam desired. Plating, electropolishing are used

Reflectors get a fast, uniform buffing in special machines



Unbreakable glass is rolled into reflector lip



On assembly line sockets for bulbs are inserted

Republic Expands Tube Mill

Company plans to increase seamless tube production by 70 per cent

REPUBLIC STEEL CORP. is increasing the capacity of its South Chicago seamless tube mill by nearly 70 per cent with addition of new facilities for rolling small-size seamless tubing. This is the first project of the expanded capital expenditure program for 1954, recently announced by C. M. White, president.

The project is scheduled for completion by spring, 1955, and will increase the capacity of the seamless tube mill from 186,000 tons a year to 312,000 tons a year.

Major equipment to be installed includes a billet heating furnace, piercing mill, plug mill and two reelers. Completion of the new mill will enable Republic's seamless mills to produce bearing tubing, refinery piping and other seamless tubular items in addition to the oil country tubular goods now being made.

Kropp Enlarges Facilities

Kropp Engineered Products, Cicero, Ill., a subsidiary of Kropp Forge Co., Chicago, is installing $1.5 million worth of machinery and equipment which will enable the company to perform all types of machining of both ferrous and nonferrous metals. New facilities include milling machines, various types of lathes, grinders, shapers, die-sinking equipment, drill presses, tool grinding and sand blasting equipment, magnaflux and ultrasonic testing machines and precision jig bore equipment.

Nord Moves to New Plant

Nord International Corp. opened a plant at Orange, N. J., where the main office and experimental and development departments will be located. These were formerly at Denville, N. J.

Westinghouse Rearranges

Westinghouse Electric Corp. plans to rearrange productive facilities at its Trafford Micarta Division plant, Trafford, Pa. About half of Micarta division's production of laminated plastics will be moved to the division's Hampton, S.C., plant, and other operations will be moved into the space made available at Trafford.

Form Ore Treating Division

Dwight-Lloyd Inc., a new division of Sintering Machinery Corp., Netcong, N. J., has been formed to design, construct and sell ore beneficiation plants and related process equipment. The current research program of Dwight-Lloyd has resulted in new equipment and processes for the economical treatment of taconite and other low-grade ores. H. E. Rowen is vice president.

Inco Center Built for Speed

International Nickel Co.'s new $1.7-million distribution center at Huntington, W. Va., includes engineering innovations for product protection, high-accuracy "print-weight" scales and one of the largest truck terminals in metal warehousing. The unit is planned and engineered to speed operations and has the latest equipment for straightening, cutting and inspecting its metal products.

Brady & Associates Buy Firm

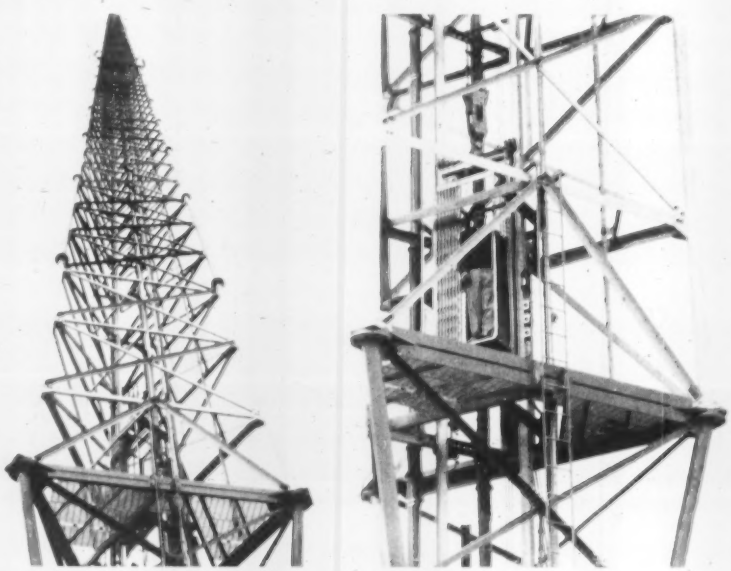
Arnold W. Brady & Associates, management engineering and consulting firm, Detroit, purchased all the outstanding stock of Townsend Industries Inc. of that city. The company specializes in metal stampings, assemblies and production painting for the automotive, aircraft, air-conditioning and radio-television industries.

Hydraulic Lab Completed

Worthington Corp., Harrison, N. J., completed its hydraulic test laboratories at Harrison. Designed basically for production or performance testing, the lab will also be used for applied research and development of fluid handling machinery. Field conditions can be duplicated for the more than 10,000 different types and sizes of pumps currently being produced.

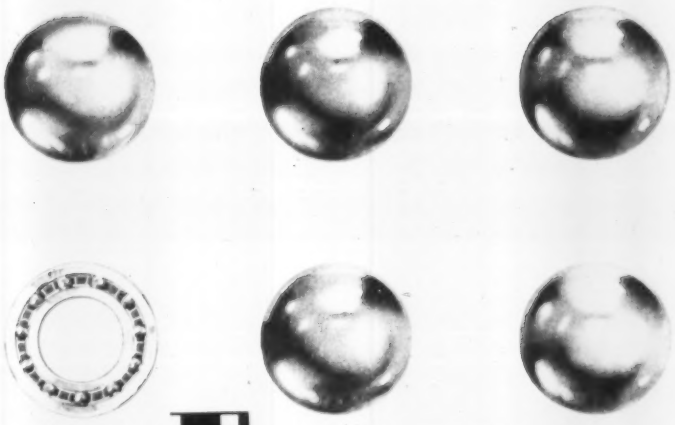
Cyanamide for South Africa

A calcium cyanamide plant, being constructed by South African Cyanamid (Pty.) Ltd. at Witbank, will for the first time make the Union of South Africa self-sufficient in production of Aero brand cyanide, a key chemical used in

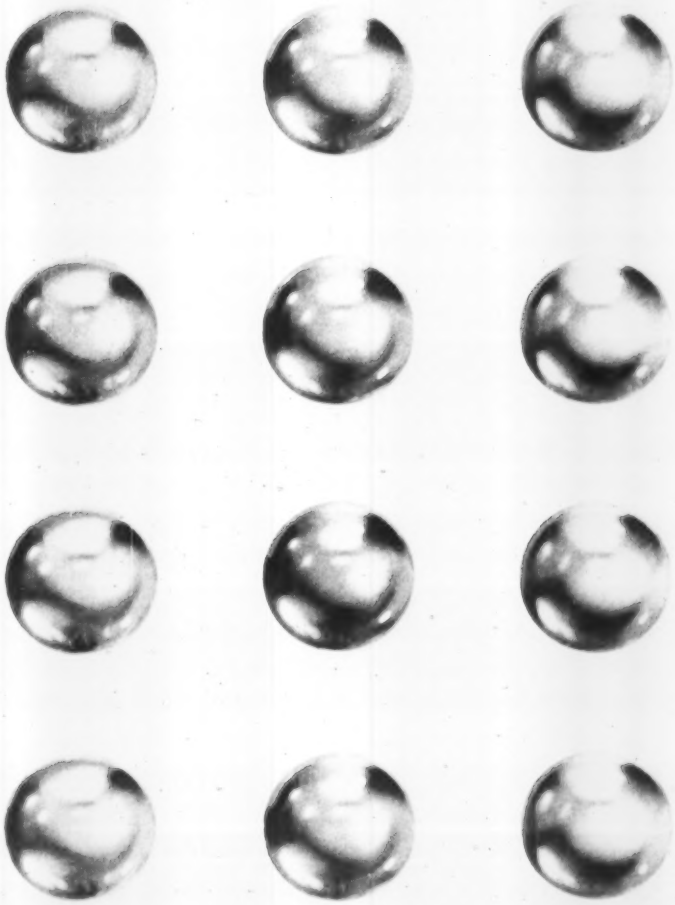


Going Up? TV Tower Has Built-In Elevator

Television tower of WHIO-TV, Dayton, O., built by Blaw-Knox Co., Pittsburgh, is 1104 ft high, so built-in elevator is appreciated by maintenance men. 14-ft triangular tower weighs 600,000 lb; base is buried concrete pyramid weighing 832,000 lb. Nine guy wires containing over 8000 ft of cable steady the tower



Federalize! *for tomorrow's tools today*



Take a *new look* at Federal!

You'll see how one of the world's largest ball bearing producers keeps ahead in this ever-changing world.

You'll see at Federal automated production that keeps quality at a peak.

You'll see at Federal the newest precision machines—modern machines that make yesterday's wide-tolerance bearings as primitive as the equipment they served.

You'll see, too, the latest quality control instruments and inspection methods in use at Federal.

Keep ahead or fall behind is the order of the day. Most alert to that are the purchasing agents and purchasing powers who won't wait till tomorrow for something that can be better today.

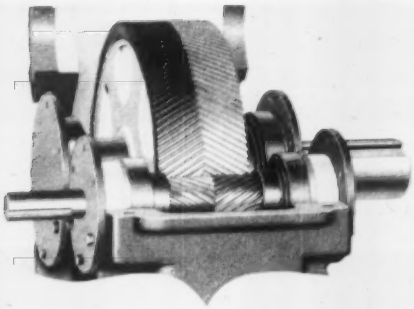
These purchasing powers are seeing how yesterday's No. 2 sources of supply have earned the right to become today's No. 1. And they are fast coming to recognize Federal ball bearings as the *modern* leaders in their field.

Federalize—and you've modernized.
Federalize—and you're ahead!

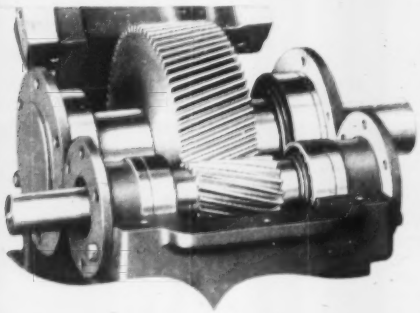
One of the world's largest ball bearing manufacturers THE FEDERAL BEARINGS CO., INC.
POUGHKEEPSIE, N. Y.

Producers of the *Modern* ball bearing

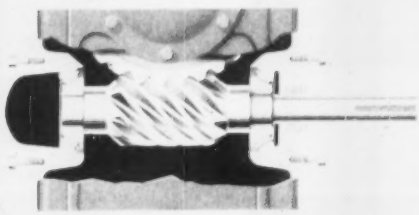
Federal
Ball Bearings



A Complete Line of Speed Reducers



HERRINGBONE · HELICAL · WORM GEAR



for Unbiased Selection of Type

• Horsburgh & Scott Speed Reducers are available in 8 general groups, 12 distinct types in many sizes and hundreds of standard ratios. Many considerations, such as speed of driving and driven shafts, shape of housing and characteristics of drive, point definitely to one specific unit as the best drive for a particular duty. Having such a complete line to select from, engineers have exceptional freedom for unbiased selection of the right reducer for the job.

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVE. · CLEVELAND 14, OHIO, U.S.A.

Send note on Company Letterhead for Speed Reducer Catalog 46

the mining industry. At present, calcium cyanamide is imported from the firm's parent company in Canada, North American Cyanamid Ltd.

Guarantees Against Price Drop

Fresh'nd-Aire Co., a division of Cory Corp., Chicago, notified its distributors that inventories of Fresh'nd-Aire 1954 room air conditioners will be guaranteed against price decline throughout the 1954 air-conditioner season.

Electroplater Expands

The Hanson-VanWinkle-Munning Co., Matawan, N. J., acquired the assets, customer lists, good will, personnel and existing business of Electroplating Equipment & Supply Division of A. J. Lynch Co. in California. The new owner will utilize warehousing and shipping facilities of Lynch and maintain offices in Lynch buildings at Los Angeles and San Francisco. The Matawan firm manufactures electroplating and polishing processes, equipment and supplies.

Plastics Sales Group Formed

A plastics sales group has been formed by Hooker Electrochemical Co., Niagara Falls, N. Y., to handle the company's new fire-resistant polyester resin. Charles Y. Cain heads the group.

New Oxygen Plant Opened

National Cylinder Gas Co., Chicago, is operating a new oxygen plant at Tampa, Fla. The company, which manufactures welding and cutting equipment in addition to industrial gases, now has 55 oxygen and 37 acetylene plants in the United States, Canada, Colombia and Venezuela.

Knox Develops New Weed Killer

A new weed killer tailored to the specific requirement of industrial weed control has been developed by Knox Chemical Co., Chicago. Named Knox-All, the weed killer eliminates all foliage and sterilizes the soil, eliminating the growth of any new vegetation from 1 to 5 years. It is also rated as an ex-

ELECTRICAL CONDUIT

PERMANENT
EASILY INSTALLED
LIQUID-TIGHT
FLEXIBLE
APPROVED

SEALTITE (TYPE U.A.) is approved by Underwriters' Laboratories, Inc. for use where exposed to moisture or mineral oils (up to 600 Sec. N.E. Code Art. 351)

SEALTITE

ELECTRICAL CONDUIT PROTECTS WIRING

against oil, grease, water, dirt, chemicals, corrosive fumes, salt spray, weather

SEALTITE* is a flexible *and* liquid-tight electrical conduit. It gives maximum protection to your wiring where it must connect moving parts, absorb vibration, follow machine contours, flex into U-bends, be easily maintained or be safeguarded between misaligned parts.

It is being used successfully in wet locations, in tunnels, power plants, steel mills, canneries, chemical industries and in many outdoor applications. SEALTITE comes in two types:

TYPE U. A.—(U.L.-approved. Made with flexible galvanized steel core, positive ground and tough outer cover.)

NOM. I.D. (Inches)	INSIDE DIA. (Inches) Min.	Max.	OUTSIDE DIA. (Inches) Min.	Max.	APPROX. INSIDE BEND DIA. (Inches)	EST. WEIGHT per hundred ft (Pounds)
⅜	.484	.504	.690	.710	8	30.0
½	.622	.642	.820	.840	10	36.6
¾	.820	.840	1.030	1.050	15	48.2
1	1.041	1.066	1.290	1.315	18	67.7
1¼	1.380	1.410	1.630	1.660	21	116.5

TYPE E. F.—(Extra Flexible) for machine tools and industrial equipment. (Meets standards set by I.E.C.) *Pat. Applied For

NOM. I.D. (Inches)	INSIDE DIA. (Inches) Min.	Max.	OUTSIDE DIA. (Inches) Min.	Max.	APPROX. INSIDE BEND DIA. (Inches)	EST. WEIGHT per hundred ft (Pounds)
⅜	.485	.505	.690	.710	5	24.3
½	.620	.640	.820	.840	6	29.0
¾	.815	.835	1.030	1.050	9	38.2
1	1.025	1.055	1.290	1.315	10	65.0
1¼	1.365	1.395	1.630	1.660	13	84.4
1½	1.575	1.605	1.870	1.900	15	122.0
2	2.020	2.055	2.335	2.375	17	158.0
2½	2.480	2.515	2.840	2.875	20	205.0
3	3.070	3.110	3.460	3.500	27	290.0
4	4.000	4.050	4.460	4.500	34	430.0

Commercial tolerances apply on above figures.

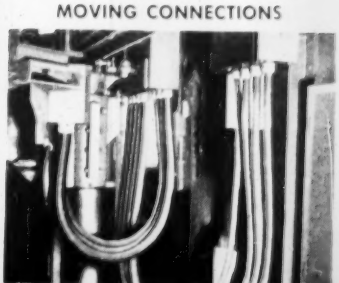
ELECTRICAL WHOLESALERS stock both types. Buy it in long random lengths as shown, then cut without waste. Or ask your wholesaler to cut the length you need. Liquid tight connectors are available from wholesalers' stocks. Write for Bulletin UA-751. *The American Brass Company, American Metal Hose Branch, Waterbury 20, Conn.*

*Trade Mark

SEALTITE flexible, liquid-tight electrical conduit an ANACONDA* product

FOR WET SPOTS

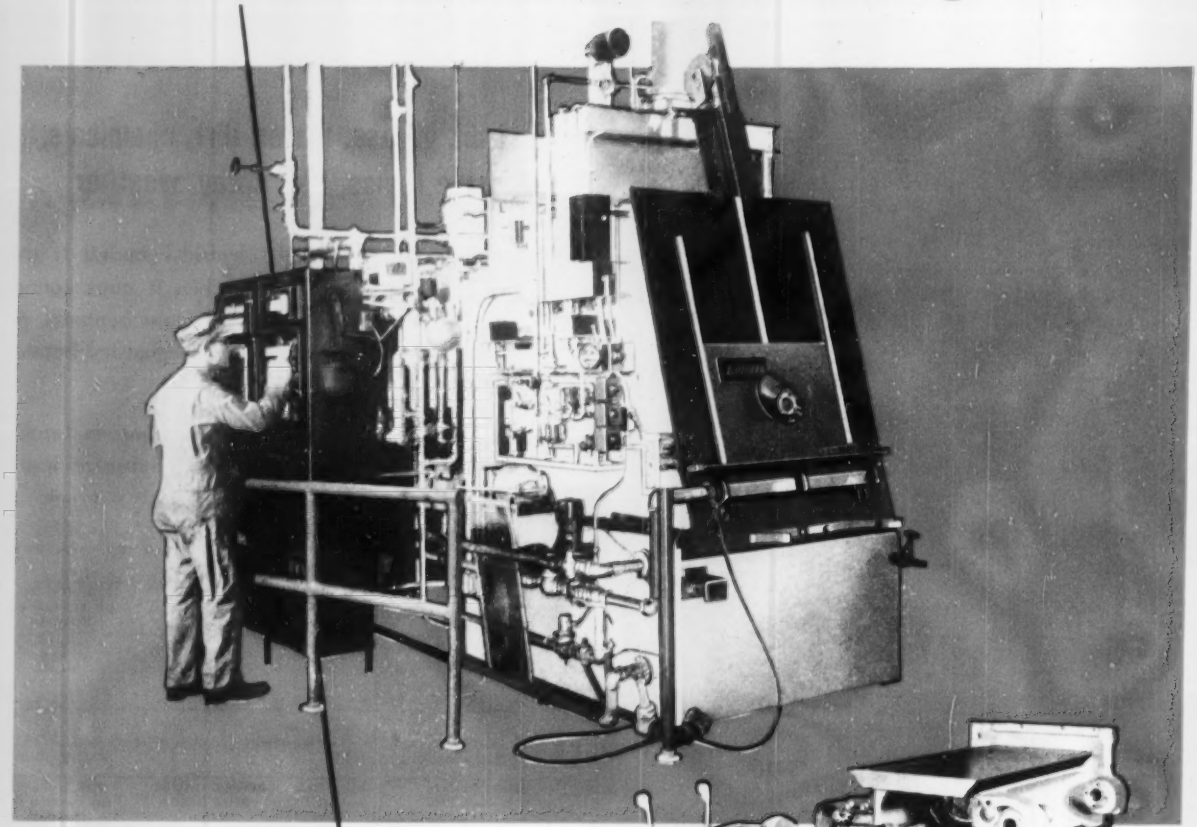
MOVING CONNECTIONS



OUTDOORS

MISALIGNMENT

Kearney & Trecker Cuts Gear Carburizing Time 4½ Hours with *LINDBERG* Carbo-nitriding Furnace!



Eight hours! That's how long it formerly took Kearney & Trecker's heat treating department to carburize a 300 pound charge of "secondary feed change cams and gears" to .030 case depth . . by pack carburizing and hardening in pit furnaces.

But now, with a new Lindberg Carbo-nitriding Furnace, K & T heat treaters handle the complete job in only 3½ hours . . a saving of 4½ hours over the old method!

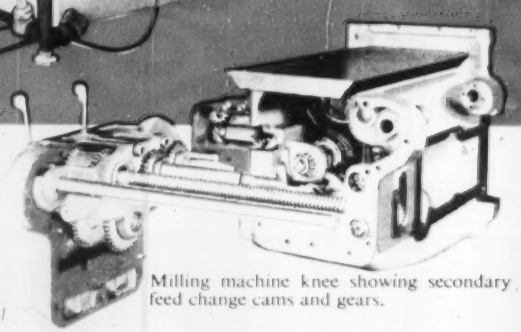
This "before and after" procedure list tells the story:

BEFORE . . . with old box furnace and pit hardening furnace.

1. Pack parts in box
2. Load in carburizing furnace
3. Heat to specified temperature
4. Remove box from furnace . . . and cool
5. Remove cooled parts from box
6. Load parts on fixture
7. Lower fixture into pit hardening furnace
8. Heat to hardening temperature
9. Remove heated parts and fixture from work chamber
10. Quench in oil
11. Remove parts from fixture

AFTER . . . with new Lindberg Carbo-nitriding Furnace

1. Place parts in open work basket
2. Load baskets and work into Lindberg Carbo-nitriding furnace.
3. The furnace then takes over, carburizing, hardening and quenching the load automatically without use of fixtures.



Milling machine knee showing secondary feed change cams and gears.

And there are other advantages! One operator was released for other important work. Greater uniformity was obtained. Core toughness improved because of the lower temperature used.

But the story doesn't end here. K & T uses this same furnace to carbo-nitride screws, nuts, T-bolts and washers (in 40% less time than with wet cyaniding) . . and also to handle the neutral hardening of studs (at pronounced labor savings).

And there are still other applications! . . carbon correction, and tool treating and annealing. The versatile Lindberg Carbo-nitriding furnace can do a job for you, too . . ask for details and descriptive bulletin No. 241.

LINDBERG FURNACES

Lindberg Engineering Company • 2441 West Hubbard Street • Chicago 12, Illinois

cellent termite insect killer, mold destroyer and wood preservative.

Sylvania Builds In Canada

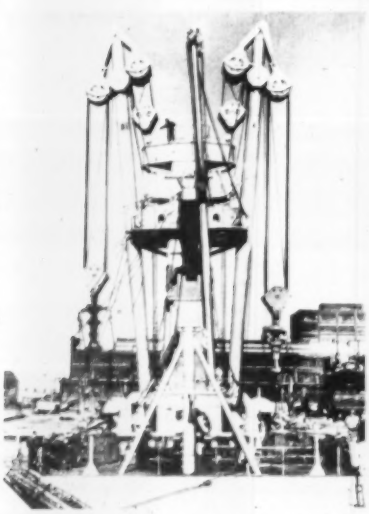
Sylvania Electric (Canada) Ltd. announced that a new plant will be built in Dunnville, Ont., for production of television sets. Indications are that production will get under way this summer. Sylvania will invest about $750,000 in the plant which will cover 61,000 sq ft of floor space.

Bryant Heater Agency Formed

Bryant-Daybar Co. Inc., Buffalo, has been incorporated by Mark A. Daly Jr. and Edgar J. Bardol for wholesale distribution of equipment manufactured by Bryant Heater Division of Affiliated Gas Equipment Inc., Monrovia, Calif.

Foundry Opens Division

Howard Foundry Co., Chicago, is opening a new lost wax precision investment casting division in Los Angeles. Close tolerance, complex ferrous castings requiring little, if any, machining are to be produced. Howard also started casting beryllium copper in its Aluminum and Bronze Division at Chicago.



Seagoing Weight Lifter

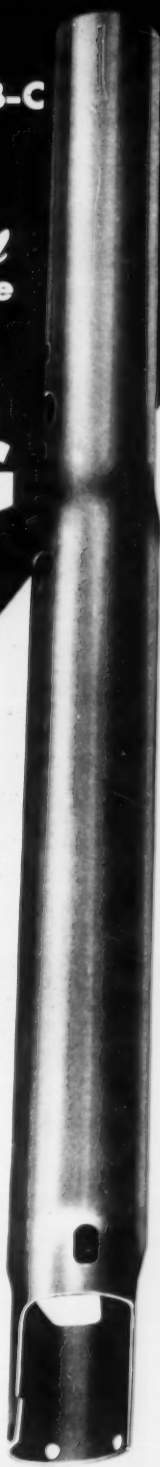
Cargo-handling gear installed by Bethlehem Steel Co., Brooklyn yard, will enable USNS Brostrom to load and discharge cargo without dependence on shore facilities. The gear can handle loads up to 150 tons

the A-B-C of M-S-T

A ALWAYS MAKES POSSIBLE
B BETTER PRODUCTS
C AT LOWER COST

Michigan
Electric Resistance
WELDED
STEEL
TUBING

A Quality Product



ROUND

⅜" to 4" O. D. 8 to 22 gauge

SQUARE-RECTANGULAR

½" to 2" O.D. 20 gauge
1" to 2¼", 14, 16, 18 gauge

Carbon 1010 to 1025

Michigan Tubing has uniform strength, weight, ductility, I. D. and O. D., wall thickness, machinability, and weldability. It can be flanged, expanded, tapered, swaged, beaded, upset, flattened, forged, spun closed, fluted, and rolled. Available in a wide range of sizes, shapes and wall thicknesses, prefabricated by Michigan or formed and machined in your own plant.

Steering Jacket

Ready for the automobile assembly line is this vital volume produced tubular part of a major control unit.

Lower tube end is reduced to 2.260" O. D. x 10.525" long, held to close tolerance for assembly in line with body of base tube without machining. Upper end is reduced to 2.125" O. D. x 2.562" long, held on center line to extremely close decimal dimensions, with two perforations at tapered section. Michigan workmanship can always be depended upon to assure the exacting tolerances and part uniformity to keep customer assembly operations moving smoothly.

Michigan engineers will be pleased to work with you on an adaptation of welded steel tubing to help you make your product better at lower cost.

Consult us for engineering and technical help in the selection of tubing best suited to your needs.

Plus Fabricating of our own tubing Michigan is interested ONLY IN THE FABRICATION OF Stainless steel, copper, brass and aluminum tubing.

THE OLDEST NAME IN ELECTRIC RESISTANCE WELDED STEEL TUBING

Michigan STEEL TUBE PRODUCTS CO.

More than 35 Years in the Business

9450 BUFFALO STREET • DETROIT 12, MICHIGAN

FACTORIES: DETROIT, MICHIGAN—SHELBY, OHIO

DISTRIBUTORS: Steel Sales Corp., Chicago, St. Louis, Milwaukee, Indianapolis and Minneapolis—Miller Steel Co., Inc., Hillside, N. J.—C. L. Hyland Co., Dayton, Ohio—Service Steel Co., Los Angeles, Calif.—Strong, Carlisle & Hammond Co., Cleveland, Ohio—Globe Supply Co., Denver, Colorado—W. A. McMichaels Co., Upper Darby, Pa.—A. J. Fitzgibbons Co., Buffalo, N. Y.—Harry E. Clark & Co., Houston Texas.

You don't pay EXTRA for the EXTRA FINE PRECISION of

"Fischer Turned"

BRASS NUTS

WHY PAY THE PRICE OF PRECISION AND THEN NOT GET IT?

SWITCH TO "FISCHER TURNED" BRASS NUTS! Save when you buy! Save when you use! Held to Class 2 tolerances, *"Fischer Turned"* Brass Nuts feature 75% full threads and are tapped through at 90° to the face . . . they are counter-sunk on both sides and completely free from burrs and grease.

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Fast Deliveries, Too!

OVER A THOUSAND DIFFERENT SPECIAL SIZES are in regular production along with a complete range of standard size nuts. By dealing with Fischer you get prompt, worry free delivery . . . your order is guaranteed to arrive on or before the promised delivery date. Specify and order *"Fischer Turned"* Brass Nuts for **PRECISION, PRICE** and **POSITIVE DELIVERY!**

Fischer SPECIAL MFG. CO.
446 Morgan St., Cincinnati 6, Ohio

WESTERN UNION TFI BELL SYSTEM TELETYPEWRITER CI 448 U TELEPHONE WOodburn 1280

"Sandwich" Wall

Two sheets of aluminum with glass fiber between are used to cover heavy press plant

A NEW ALUMINUM "sandwich" wall with twice the insulation value of a 12-in. masonry wall was used at the Air Force heavy press plant at the Cleveland Works of Aluminum Co. of America.

How It's Made — The curtain wall is fabricated from two corrugated aluminum sheets with a 1-in.-thick layer of glass fiber insulation between. The plant, one of the first to use aluminum sandwich construction, took 157,711 sq ft of the new siding.

The wall was installed by E. G. Smith Co., Emsworth, Pa., and Toledo, O., who submitted the over-all low bid for the contract, which also covered the erection of roof deck, ventilators, built-up roofing and other superstructure items.

No Prefab Needed—The wall was constructed on the job. First a layer of 0.024-in. Alcoa corrugated aluminum siding was applied with self-tapping screws to the siding girts of the structural steel framework. The Fiberglas (Owens-Corning Fiberglas Corp.) insulation was temporarily bonded to the sheet with a reclaimed rubber adhesive. Then the outer layer of 0.032-in. Alcoa industrial siding was secured to the structure with self-tapping screws which also permanently hold the insulation in place.

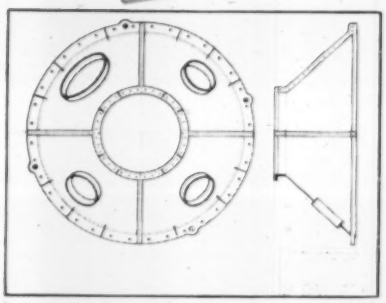
Federal Changes Name

Stockholders of Federal Enterprises Inc., Chicago, voted to change the company name to Federal Sign & Signal Corp. The company makes outdoor electric signs and industrial, emergency and military signaling devices.

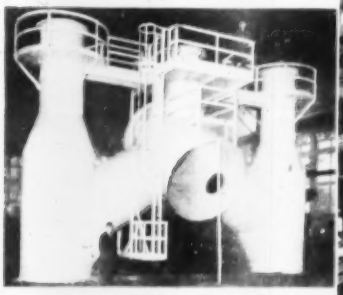
Wheatland Tube Expands

Wheatland Tube Co., Philadelphia, is rapidly completing its Wheatland, Pa., plant expansion program adding 40,000 sq ft of operating space and new shipping and manufacturing facilities. Growth of demand for electric-weld tubing, hot-dip galvanized

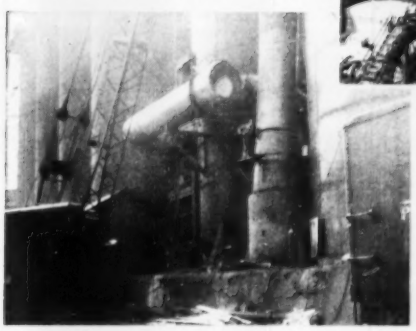
POLLOCK



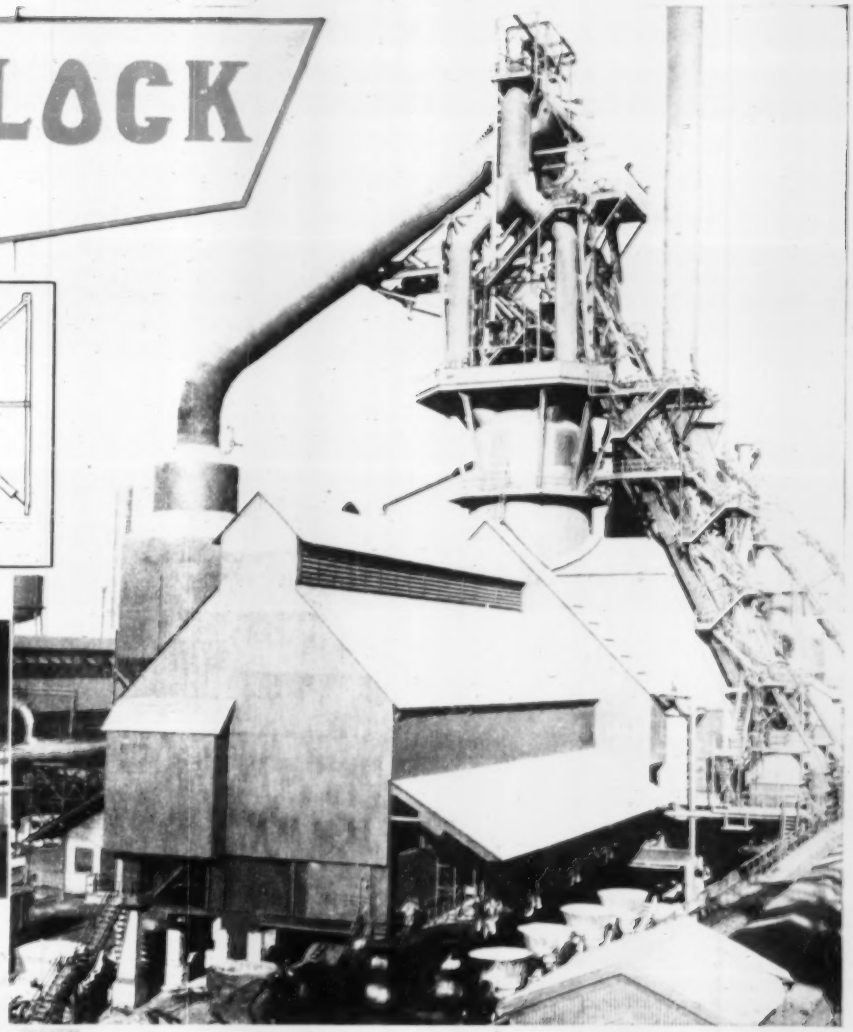
ENGINEERING



SHOP FABRICATION



FIELD ERECTION



Correlating the skills of Pollock engineering, fabrication and field erection to specific operational requirements of The Youngstown Sheet & Tube Company are evidenced in this blast furnace. In addition to furnishing the steel work for this blast furnace, Pollock designed and built auxiliary equipment, including the hot metal ladle cars and cinder cars shown in the above picture. The experience which the Pollock Company has gathered in over eighty five years is available to you in planning your new projects.

Blast furnace STEEL WORK

POLLOCK

THE WILLIAM B. POLLOCK COMPANY

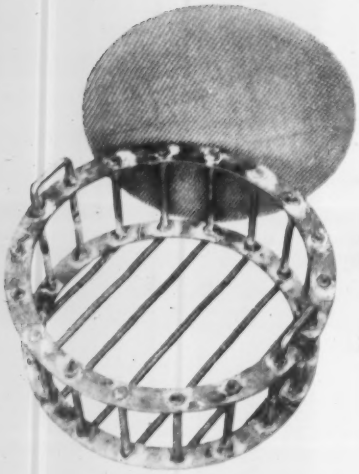
YOUNGSTOWN · OHIO

STEEL PLATE CONSTRUCTION · ENGINEERS · FABRICATORS · ERECTORS

BLAST FURNACES · HOT METAL CARS AND LADLES · CINDER AND SLAG CARS · INGOT MOULD CARS · CHARGING BOX CARS · WELDED OPEN HEARTH LADLES

ROLOCK

FABRICATED HEAT AND CORROSION RESISTANT ALLOYS



Loose joints that beat *stiff* competition

When you are heat treating metal parts at the extremely high temperature of 2350° F. . . . followed by a brine quench . . . basket construction is vitally important.

In this instance, a large auto manufacturer asked Rolock engineers for a quantity of basket assemblies that would withstand the heat and shock of martempering auto parts . . . with the greatest resistance to warping.

The answer was 18" dia., 7½" deep Inconel baskets of 26 lbs. each. They were fabricated from ½" dia. rod threaded thru flat bar and held in place by washers welded to the ends of the bar to form a loose jointed carrier . . . to take expansion and contraction without damage. A 4-mesh .080 wire disc is placed loosely in the bottom of the baskets.

There are many similar operations where loose joints will greatly extend basket life, reducing hourly costs . . . reflected in competitive quotations. Put us on the spot for solving heat treating problems. We like it!

SEND FOR CATALOG B-8 (HEAT TREATING)
ON B-9 (CORROSION RESISTANT)

SALES AND SERVICE REPRESENTATIVES FROM COAST TO COAST

ROLOCK INC. • 1262 KINGS HIGHWAY, FAIRFIELD, CONN.

JOB-ENGINEERED for better work
Easier Operation, Lower Cost

Wire Averts Broken Heads

Wire mesh mat protects motorists at Carroll's Point, Wash., from falling rocks. Mat is supported by ¾-in. cables anchored on top of the slope

---

spurred the modernization program.

ASSOCIATIONS

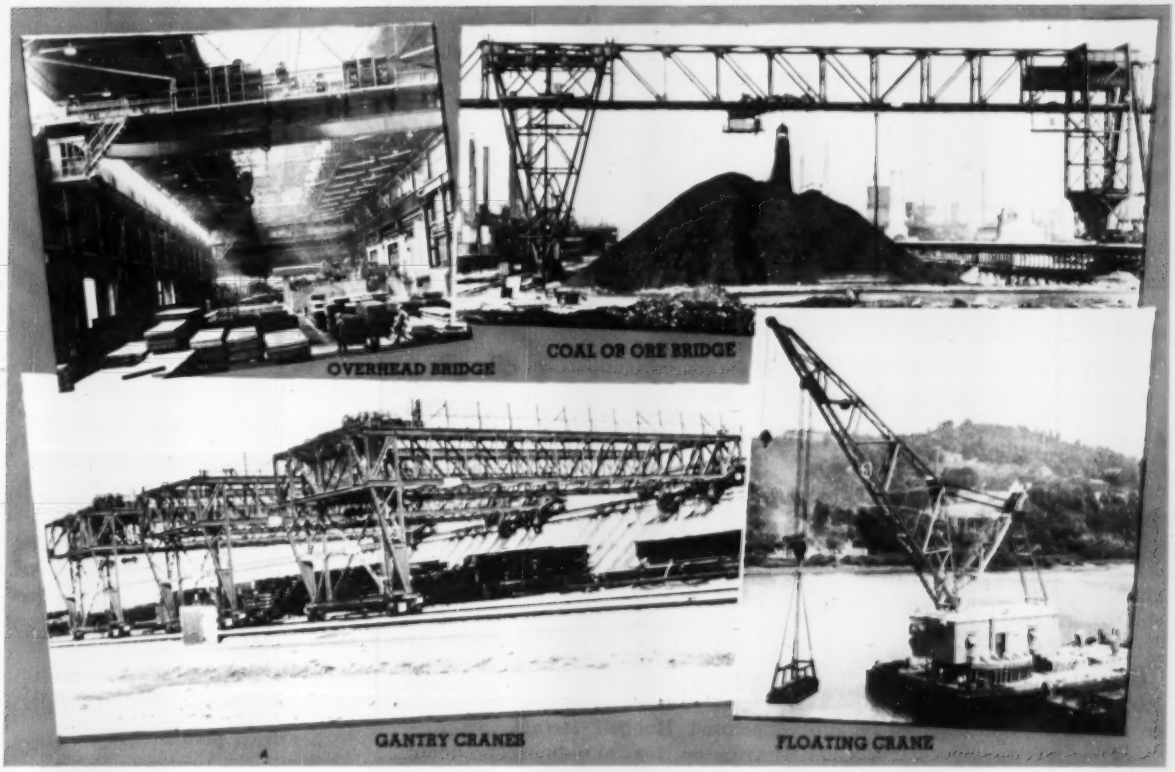
Adm. Paul F. Lee, USN ret., received the 1954 Edward P. Connell award of **American Gear Manufacturers Association**, Pittsburgh. Admiral Lee is vice president of Gibbs & Cox Inc., New York, naval architects and marine engineers. The association also announced the appointment of Gerald L. Scott as staff engineer.

Charles W. Trout, vice president and director of sales of Oneida Products Corp., Canastota, N. Y., was re-elected president of **School Bus Body Manufacturers' Association**, New York.

American Leather Belting Association changed its corporate name to National Industrial Leather Association. The association's office remains at 320 Broadway, New York 7.

Ten $1000 scholarships will be awarded in 1954 by **American Institute of Steel Construction**, New York. To be eligible, students must be nominated by one of the

CLARK CRANE CONTROLS



• BETTER PERFORMANCE • LESS MAINTENANCE
• GREATER SAFETY — *for any type of crane*

Of the many outstanding performance, maintenance and safety features built into CLARK Crane Controls, three are especially important:

1. The VARI-TIME PRINCIPLE. Smooth, rapid "definite-time" acceleration is achieved by the famous CLARK VARI-TIME core, guaranteed trouble-free for the life of the equipment. This is built as an integral part of the "RT" contactor for the ultimate in simplicity, or furnished with the "VT" relay—a relay built like a contactor. It greatly simplifies the circuits.
2. The CLARK Plugging Relay used on the Bridge and Trolley Control is completely foolproof, and cannot get out of adjustment. It prevents equipment abuse and eliminates needless use of the foot brake.
3. The CLARK Hoist Control features a circuit designed and interlocked to prevent opening of the armature-series-field circuit for protection during lowering.

Many additional features contribute to fast, dependable performance and consistent, trouble-free service.

If you have a crane control problem, consult your nearest CLARK representative or write us direct.

Typical CLARK Crane Hoist Control Panel.

ENGINEERED ELECTRICAL CONTROL

THE CLARK CONTROLLER CO.

1146 EAST 152ND STREET, CLEVELAND 10, OHIO

290 firms that are AISC members.

NEW ADDRESSES

A. W. Leet & Associates Inc., Michigan sales representative for Mercury Mfg. Co., Chicago, materials handling equipmentmaker, moved to 16856 Meyers Rd., Detroit 35.

Glassheat of Canada Ltd., Toronto, Ont., manufacturer of radiant heating units, consolidated its operations in a new factory and office building at 1603 Queensway.

The Philadelphia office of **Brown & Sharpe Mfg. Co.**, Providence, R. I., machinery and tool manufacturer, is now at 7 Bala Ave., Bala-Cynwyd, Pa.

Struthers-Dunn Inc., relay manufacturer, moved from Philadelphia to Lambs Road, Pitman, N. J.

Consolidated Engineering Corp., Pasadena, Calif., instrumentmaker, moved the southeastern regional offices of its subsidiary, CEC Instruments Inc., from Washington to 3224 Peachtree Rd., Atlanta. A district office will continue in Washington.

The New York executive offices of **Luria Brothers & Co. Inc.**, are now at 99 Park Ave. The offices will be shared by Livingston & Southard, the company's import and export division.

Steel Plate Fabricators Association moved its office to 79 W. Monroe St., Chicago 3.

REPRESENTATIVES

Reynolds Metals Co., Louisville, named as distributors American Alloys Corp., Kansas City, Mo., and Bridgeport Brass Co., Cleveland. American Alloys will stock aluminum pig and ingot in standard and special analysis alloys, and Bridgeport Brass will stock aluminum wire, rod and bar (screw machine products) in standard alloys and sizes.

Kaiser Aluminum & Chemical Sales Inc., Oakland, Calif., appointed Hubbell Metals Inc. distributor for aluminum products in the St. Louis, Kansas City and Indianapolis trading areas.

Just Like Grandma Used To Have

When bricklayers at Armco Steel Corp.'s Butler, Pa., plant put a new roof on an electric furnace, grandma would feel right at home. Armco uses blackstrap molasses as a bonding material; the sticky cane juice fuses bricks together without slipping. It takes two buckets of molasses to build each new roof, and the company uses about two barrels per year. It's also good for patching

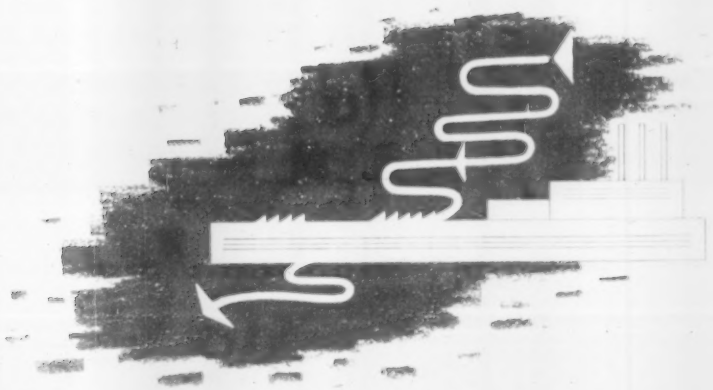
3

STEEL's 1954 Management Series . . . .

The editors of STEEL herewith present the third in their ten-part series, Program for Management for 1954. The complete list:

1. **Now You Have To Sell** (Feb. 22, p. 91)
2. **Build Better Bosses** (Mar. 22, p. 81)
3. **Automation—How Far Should You Go?**
4. **Regularizing Production, Employment**
5. **Distribution—Integration Needed**
6. **Distribution—Training Personnel**
7. **Distribution—Transportation**
8. **Product Diversification**
9. **Foremen—Bridge to More Efficiency**
10. **Product Design**

STEEL



Automation . . .

How Far Should You Go?

You can automate virtually any production or procedures function—if you can justify it economically. Question is not "should you?" but "to what degree?"

AUTOMATION is glamorously stereotyped as the flesh and blood of the "second industrial revolution." But it is neither revolutionary by nature nor distinct from mechanization, the instrument of the only industrial revolution to date.

Automation is simply the natural evolution of the growing trend toward more efficient operation, a trend that is being shaped to meet a changing economic picture.

For the first time in some 15 years, metalworking management is faced with a market that is not stimulated by war, rearmament or starved consumer demand. Low unit costs are a must if industry is to operate at a profit, and automation is part of the answer.

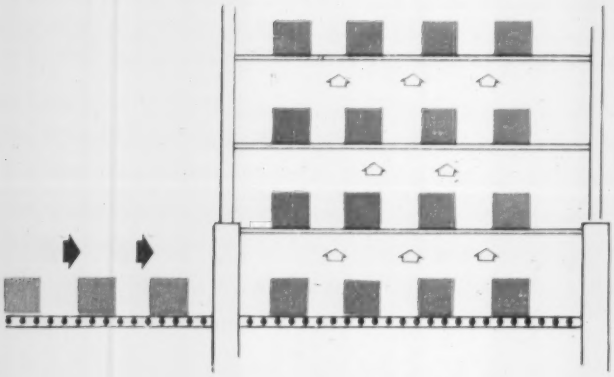
What Is It?—Like the concept of "paradise," definitions vary with the individual. To the electronics engineer, it implies a completely closed-loop system of controls, focused on the basic concept of feed back. To instrument specialists, it is instrumentation control. To some research men, it centers on the design and utilization of electronic computers. To many engineers, it simply implies automatic handling.

Actually, much of industry understands automation as more encompassing than any of the "specialists" do. Including all the narrower concepts, the majority view sees it as the automatic processing of any product in procedures, production, handling and distribution.

The Start—The term as it is known in industry today originated in the automobile industry. It was coined to describe the automatic transfer of a workpiece from one operation to another, and the automatic performance of succeeding operations. Best known, most widely publicized examples will include Ford Motor Co.'s Cleveland engine plant, the Rockford ordnance plant and Ford's Buffalo stamping plant.

The name, however, is newer than the idea. About 161 years ago a mill near Philadelphia automatically processed grain into flour with no human labor involved. As a matter of fact the commonplace automatic multi-spindle screw machine incorporates the essence of automation when it automatically transfers the workpiece through a sequence of stations and operations.

By Steps—Application of automation is a matter of degree. Some



Banking

DOWNTIME is perhaps the most critical problem on automated transfer lines. Some of it is unavoidable, but its minimization is the key to economic production.

Problem becomes compounded on *automation* lines. Each machine is linked to and dependent on the continuing performance of the rest of the machines. As each separate unit or section is shut down, all others become inoperative.

So, for example, in a machining line with five units (each of which must be stopped 15 minutes a day for tool change) the whole line has an accumulated downtime of 75 minutes a day. At a production rate of 2 parts a minute, line will lose 150 parts in each day's run.

If work parts could be stored between machines and automatically put into or taken from the storage as needed, it would be possible to shut down any one machine for tool change while the remainder of the line continues to operate.

Here's how: In a line rated at 2 parts a minute, workpieces move from unit A to B to C. When unit B is stopped, unit A continues to produce, but the parts are automatically directed into a banking area. Unit C also continues to work, drawing parts from a previously filled parts bank between B and C. If B must be down 15 minutes for tool change, both banks must hold a minimum of 30 parts.

Going back to the machining example, accumulated line downtime for the day will be just 15 minutes (instead of 75 with no banking), assuming that no two machine units are down at the same time. Loss will be 30 instead of 150 parts a day.

You can bank several ways. One is to allow a sufficiently long connecting link between machines to store the required number (in the example, 30) of parts. Space required for this is often the prohibiting factor.

Another device is shown in the above illustration. Unit is essentially a multi-tiered elevator. Parts are conveyed to one level or tier; when it is filled, a switch is tripped and the elevator moves up one tier.

Then parts may be automatically taken off the bank and put back into the line. In the drawing, parts can be put on from the left and taken off to the right. Bank could be mounted right in the line. If it is more expedient to place the bank at right angles to the line, parts can be taken off to the left.

Banking systems would be used only when an adjacent machine is down. Otherwise, parts bypass the bank completely and move directly through the line.

production operations, such as surface cleaning and finishing, have been automated as far as handling is concerned for a number of years.

Historically, the chemical industry, many bottling and canning plants, the food processing industries and others have accepted the principles of automation as everyday production techniques. For several reasons, the advance from "doing it by machine" to "doing it *automatically* by machine" has evolved slower in metalworking than in some of these other fields.

Holdup — It simply hasn't been needed that's the reason for the slower start in the metalworking industry. Automation comes into the picture only when people can't do the job well enough, fast enough or cheap enough.

So far, in most metalworking jobs, people have been able to keep up with demand. Now, however, quality, quantity or cost demands have changed and automation comes into the picture as the only solution.

Basic Need—The starting point for automation goes back beyond design and purchase of equipment for a job. It starts as an attitude in the minds of management.

Conversion from hand operation to an automatic process has one fundamental requirement—the job must be approached from a completely new angle; it must involve *rethinking*.

Automation is not simply doing by machine what has been done by hand. Mechanical duplication of manual techniques and performance can result in a Rube Goldberg device that might be spectacular, expensive and entirely inefficient.

Matter of Dollars—Automation is essentially an economic consideration—here is where the rethinking begins. Questions must be asked: "Does our market justify the capital investment for automation, demand higher production rates and/or lower unit costs?" "Can we produce this product differently to make automation economical or should we redesign the product itself for automation?"

Redesign may turn out to be nothing more than standardization. When the same product is made in several sizes or models, standardization on several components

may make it practical to go into high production on these component parts, where it would not have been economically justified to do so before.

A good example is in the automotive industry, where there is an extensive overlap of bodies through a complete line of seven or eight models.

How Far?

Factors influencing degree of automation that can be applied in any given case are: Available capital, present and proposed production equipment and capacities (including length of production runs and frequency of model change), nature of the workpiece and of the operations to be performed, available personnel and plant size and layout.

Capital—The money you have to spend will naturally determine the extent to which you can change from the conventional methods of your present production setup. It will, in some cases, preclude the use of automation. On the other hand, it will often be the deciding factor in favor of automation.

There is no rule of thumb for determining the cost of an automated process or a segment of that process. Simple automation, as that incorporated into an automatic, multi-spindle screw machine, is most often thought of as a feature of the machine, having no separate cost. Costs of standardized, dial-type machines, hopper feeds, automatic welders, etc. are generally established, but special installations must always be considered on an individual basis.

Part Way—It is often practical to automate only part of the whole process. Automating 80 or 90 per cent may offer substantial savings in manufacturing costs and may soon pay for itself.

On the other hand, the cost of automating the remaining 10 or 20 per cent of the handling may prohibit the whole scheme.

Cheapest—As E. W. Franz, secretary, May-Fran Engineering Inc., Cleveland points out, automation may be the cheapest way to boost production. He cites an example where automatic chip disposal systems on five machines decreased downtime. Devices cost considerably less than a sixth machine, which would have been necessary to get the same increase in production.

Small, powered conveyor units connecting punch presses also raised the productivity of the line and at an initial investment far less than that required for additional press capacity.

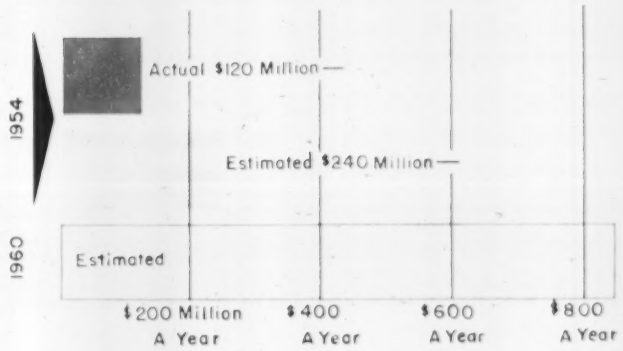
As shown in the accompanying illustration, Ralph E. Cross, executive vice president, Cross Co., Detroit, points out that initial investment is not necessarily an indicator of final cost. He says:

"The choice of the best process is accomplished by comparing the merits of several proposed plans of operation over a one-year period. Each proposed plan must take into account all factors of the company's profit, including sales income, material, labor, factory expenses, administrative expenses, interest and income taxes."

Production Plans—It is improbable that a highly automated process will ever be used to make a one-of-a-kind type product. Cost of conversion from one job to another makes this impossible. Production requirements must be sufficiently large to justify continuous production over a reasonable length of time.

Notable exceptions to this are the tape or punched-card systems of machine control, such as the milling machine at Massachusetts Institute of Technology. They are still too expensive to be generally practical, but continuing development promises to make automation in the job shop a paying proposition.

Convertible—While many auto-

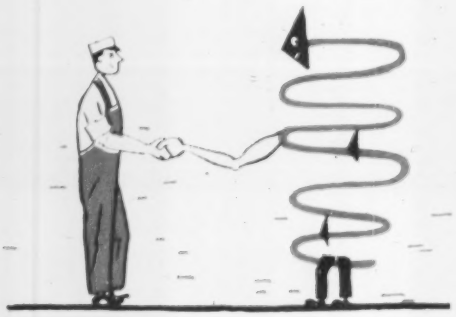


How BIG is Automation?

*STEEL's estimate of the money to be spent in 1954 for metalworking automation equipment. Estimate is based on the known figure of $10 million spent each month on metal*cutting* automation alone. Latter figure (accurate to within 10%) is average for last 6 months 1953.

Overall metalworking average, admittedly conservative, was arrived at by doubling metalcutting volume to include automation in stamping, heat treating, casting, assembly, etc.

STEEL's editors then asked a group of automation authorities for their estimates for the year 1960. Most of them felt volume would be higher than it is today; averaged guess was 3½ times higher. This is how we came up with the $830 million figure for 1960.



No Red Flag

PROBLEM of employee and union objection to automation is usually exaggerated. Often the issue never is brought up.

At Ajax Mfg. Corp., Detroit, executives last year decided to replace their batch-plating setup with a highly-automatic plating line. It involved about 12 operators on the old line. New line would require only 3 men to do the job.

M. K. Pitts, executive vice president, points out that in their plant, as in many others, it was not a question of firing, but simply that of raising the productivity per man. While automation requires fewer operators, more are used in maintenance and in inspection. What operators once viewed as an undesirable job can now be done in better working conditions with less worker effort.

For other small plants embarking on an automation program, Mr. Pitts recommends: "Don't raise the issue with the workers or the union unless it raises itself. You may be creating suspicion or doubt where none actually exists. As the questions are raised, answer them as best you can. One word of warning: don't look at automation as if it were a device for cutting your working force in half. More often you'll need all the men you have, and sometimes more. Success of automation is not in personnel cutting but in raising the productivity per worker, and in raising the quality and uniformity of the end product.

mation setups are virtually single-purpose, many can be readily converted to conform to different part sizes or to model changes. This is even more easily done where only the transfer part of the process is automated, as in connecting conveyors.

Double Duty—A large, transfer-type metalcutting unit that will machine either one of two automotive transmission housings is under construction. Housings have a common face the one attached to the engine. Locating on this face, the machine will automatically perform its sequence of operations as prescribed for that particular housing.

At the station one, a gaging device checks the part and tells the machine which of the two pieces is coming. Proper tooling is automatically established. The two parts may run simultaneously in any order.

Standardization — Equipment builders are continually redesigning for increased versatility. They have standardized many of their beds, bases, columns, etc., which simplifies regrouping of units for a model size change.

Workpiece and Operations — Shape and size of the part directly affect the ease of converting to automation. Small parts often lend themselves to hopper feeding. Parts with simple contours are easiest to transfer and are generally easiest to locate and position.

Here's where redesign may pay off: The addition of locating points or clamping "handles" can greatly reduce the complexity of the automatic equipment. It is essential that no design be considered frozen until it has been thoroughly investigated for in-process simplification.

Working Conditions — Cost of automation varies with the operation performed. In plating, heat treating, etc., a simple conveyor (with the possible addition of timing devices) often will do the job. There is no requirement for positioning or locating.

In other operations, parts must be accurately located and clamped. The cost of this alone may preclude your going to full automation. Welding, assembly, machining and forming are examples of operations where workpiece manipulation is a key factor to the automation performance.

Personnel — Management should not regard automation as a device to reduce the total working force. By continually stressing this advantage, employers are setting themselves up for labor resistance to automation per se.

Automation should be regarded as a process that raises productivity per worker, improves working conditions, lowers the production cost per part and improves the quality and uniformity of the product.

The labor issue has caused little trouble. In spite of occasional union criticism of mechanization and automation, labor leaders have not interfered. Martin P. Durkin, former Secretary of Labor, has said: "The challenge to us in America today is to increase our inventions, to stimulate scientific progress and to raise still higher the standards of physical well being."

Inside Shift—Data will vary with

the installation, but generally total employment will be about the same before and after automation. There will be a transfer of some workers in the plant. While requirements for operating personnel are generally reduced, the need for supervisory, maintenance and servicing personnel is increased. Downtime is a problem in any production setup, but when production is increased by the automatic process, cost of downtime is considerably magnified.

The automatic production line must be kept in operation. Much of the downtime can be scheduled in the day's production run. For example, hydraulic, electric or mechanical checks, tool change and other routine activities can be anticipated. Where it's appropriate, automatic banking of work between stations will preclude shutting down the entire line for each item.

Some Help—While the maintenance man must be well trained, the equipment makers are helping to simplify his job. W. F. & John Barnes Co., Rockford, Ill., for example, believes that one of the soundest approaches to automation is through maintenance simplification.

This company is discussing the use of electric control panels consisting of sealed package units. When trouble occurs at any station on the line, the maintenance man can go to the section of the panel that controls the station. By a system of simple and rapid checks (perhaps even using indicator lights), he would be able to detect the faulty unit. He would simply pull out the complete unit and replace it with a new one. Used unit could be returned to the equipment builder on a trade-in basis or repaired at the plant. Trouble shooting could be cut from hours to a few minutes.

Overdone—Dangers of excessive maintenance costs are overrated, experts say. Much of the routine preventive measures can be built into the machine, i.e. automatic lubrication.

Plant Layout—Automation will help management use available floor space more efficiently. Dr. David G. Osborn, professor, University of Chicago, says, "Automation increases output per employee and reduces the plant space requirement. The average space reduction is around 50 per cent."

With limited manufacturing space, automation is probably the best single means of increasing output.

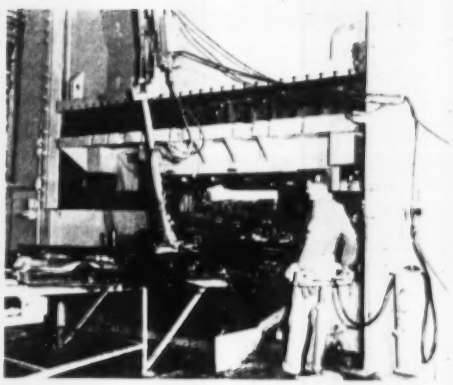
The Gem—In spite of increased productivity per worker and resultant savings, improved product quality at lower cost is probably the greatest single contribution that automation offers. Human factor, always a variable, is virtually eliminated from the production equation.

Time cycles can be made to repeat within a fraction of a second. Physical dimensions on a part can be reproduced accurately to within 0.001-inch in many operations. Most important, this accuracy and reproducibility are available at high production rates.

Consider this: "How much is it worth to me to reduce scrap and salvage $\frac{1}{3}$ to $\frac{1}{2}$ its present amount?" Discussing the salvage problem, R. W. Billingham, W. F. & John Barnes, states: "In many cases, salvage of a part merely consists of re-running it through the cycle. For example, if a drill should break in a casting, the operator can simply extract the broken segment of the drill, and then put the whole casting back through the cycle of the machine. Because of accurate location of the part relative to the cutters, light cuts due to the reworking are virtually insignificant."

Summing Up—Everett M. Hicks, vice president and manager of the Grinding Machine Division, Norton Co., Worcester, Mass., told the ASME that management must ask itself several questions:

"Have we selected the job which promises the greatest possibility of savings? Is the job one with a relatively high labor cost? What is the situation as to product design stability? Has the proposed equipment been studied for ease of maintenance and changeover flexibility for design changes when they occur? Have we skilled mechanical staff required to maintain automatic equipment or can it be obtained readily? Has labor ac-



Automated Press Feeding

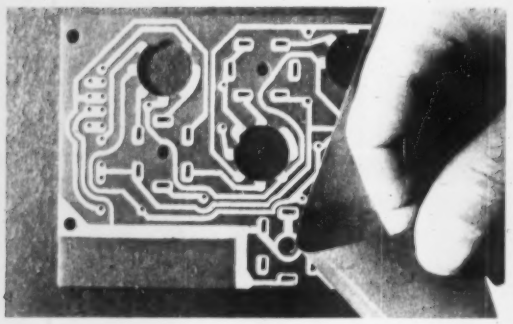
RAW MATERIAL comes in on one side of Ford's Buffalo stamping plant, goes down 19 major press lines into assembly and from there to shipping on the other side of the building. Drives for the major presses are in the basement. Automation devices are operated by air cylinders through limit switches. As long as the operator keeps the electrical circuit closed, photo, this stamping press and automation system function without pause to load, stamp and unload automotive parts.

Product Redesign

MOST EFFICIENT use of automation sometimes necessitates basic redesign to the product. Automatic assembly of electronic components would require highly complicated machines and would be virtually impractical. Printed circuits are the answer to this problem—a case of complete change of the nature of the product to permit automatic operation. New developments in this field will bring the cost of electronic equipment within the financial reach of industry, and will eventually result in broad application of electronics to automation control.

Eastman Kodak Co.

The circuit above is printed on a bit of glass-fiber cloth. It was made by: 1. Laminating a sheet of copper foil over the cloth, 2. coating a light-sensitive acid resist over the foil, 3. exposing to light through a photographic negative of a drawing of the circuit, 4. washing away the resist where the opaque areas of the negative prevented it from hardening and 5. etching away the foil where the remaining resist did not protect it.



Rubber and Asbestos Corp.

This laminated printed circuit requires only two production steps on the part of the base laminator. First the adhesive-coated copper sheet is laid on the base of impregnated paper or previously formed laminate. Next it is set in a heated press for cutting and final lamination. Bond strength is 25 to 35 pounds per inch after being bathed in solder at 235° C. Sample copper sheet is in foreground; it's available in 1 or 2 ounce weights.

ceptance of the proposed equipment been determined? Has downtime for tool maintenance been given sufficient consideration? And above all—will it pay?"

Where Will It Go?

Much attention has been directed to the application of automation in machining and in metal forming. While these two have led the way in metalworking, several other areas of manufacture show great potential.

One of the ripest spots for automation is the foundry. W. E. Dougherty, consulting engineer, Giffels & Vallet Inc., Detroit, points out, "The foundry, with the exception of certain core finishing operations, core setting and some knockout and cleaning operations, need not be concerned particularly with the shape of the pieces produced." Generally, core boxes, driers and flasks can have any desired external shape.

Pipe fittings, cylinder heads, wheels, ash trays and bevel gears could be cast using the same machines and equipment, as long as the same surfaces and projections are kept on the boxes, flasks and other containers.

Crane Co., Chicago, is now using a completely automatic cope and drag molding system. It produces 1800 completed green sand molds every 8 hours. Four men are needed. One sets cores and another removes the cores. The other two supervise the pushbutton units. In addition, there is one man pouring, one at the shakeout and one or two on relief.

Certainly one of the country's foundry show places, Ford's Cleveland foundry is highly automated in many areas. Handling of the sand is fully automatic. Other jobs are highly mechanized with many of their functions handled automatically.

Assembly — This is another of the fields in which automation can be used to a much greater degree. Assembly of many small components, as in some appliances, is a tedious, time-consuming job. Partial automation will offer cost savings almost beyond comprehension.

Circuit Magic — This, too, may call for a completely new concept

of the product. Automatic manufacture of electronic and electric circuits is a good example.

Project Tinkertoy, sponsored by the Navy's Bureau of Aeronautics, produces electronic circuits, using ceramic wafers as building blocks. Electronic components, such as resistors, are mounted on separate wafers and are held together by wires. This method of assembling circuits (it's done by machine) is roughly 40 per cent cheaper than conventional methods.

And More—Welding, heat treating, cleaning and finishing, gaging, handling and packaging also fall into the easily-automated category.

Another application, already in use is the electronic weighing and packaging of bulk products. There is no doubt that it could be used on screw machine products or other small items packaged by count or weight. Closed-loop control measures the weight assigned to the package and adjusts the filler accordingly. Systems are filling up to 90 packages a minute.

How Far Will It Go?

Most automation authorities agree it is possible to automate any production process, to accomplish virtually any production function automatically if it can be justified economically.

The practical application of relatively low-cost electronic computing systems to automation control will open new vistas. Apparently there is no limit to the future of industry. The ultimate, of course, is the automatic factory.

In the automatic factory, completely automatic production lines can perform according to a schedule supplied by computers. These computers also will solve the management problems of sales figures, orders, inventory reports, etc., and will give immediate answers.

Output of the line would be recorded and re-entered into the computers for adjustment of the subsequent operations.

Raw material could be automatically taken from the storage area assigned to a line in an established order, processed through production and assembly into packaging and onto the loading dock.

In warehousing, an example of

Cost vs. Pay

AS IS TRUE in the purchase of all production equipment, the initial cost of automation doesn't tell the whole story. This form shows how the highest first cost can be translated into long-run economy. Figures, of course, will vary with the size of the installation, the nature of the job, etc. Similar calculations should be made for all automation proposals.

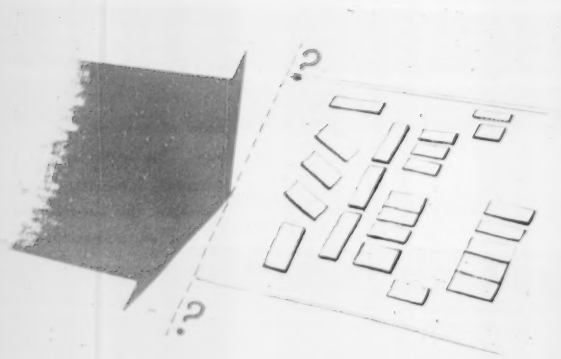
PROJECTED PROFIT AND LOSS STATEMENT FOR THREE PLANS OF PRODUCING OIL PUMP BODIES

Production 1,250,000 pieces per year

Estimated life of process 8 years

	PLAN 1	PLAN 2	PLAN 3
INVESTMENT REQUIRED	None	1,071,000	850,000
SALES			
1,250,000 Bodies @ 0.82 each	1,025,000	1,025,000	1,025,000
COST OF SALES			
Material	396,000	396,000	396,000
Subcontracting	None	None	None
Direct Labor	187,268	53,328	79,992
Rework	1,500	195	825
Setup & Tool Change	7,111	3,638	5,139
Supervision	20,250	7,000	7,000
Labor Fringes	13,290	12,892	18,511
Floor Space	4,125	5,113	4,760
Power	3,175	6,000	5,100
Taxes	5,000	21,420	17,000
Insurance	1,791	3,750	2,975
Perishable Tools	27,050	18,750	20,100
Supplies	9,200	3,750	3,825
Scrap	26,060	13,480	18,300
Tool Grinding	13,320	7,750	9,630
Machine Repair	15,500	5,100	3,750
Lubrication	3,550	1,250	2,500
Depreciation	None	93,713	74,375
Miscellaneous	28,090	7,999	11,938
	793,213	661,728	681,315
GROSS PROFIT	231,787	363,270	343,685
SELLING EXPENSE	66,625	66,625	66,625
ADMINISTRATIVE EXPENSE	43,627	36,395	37,472
INTEREST	None	None	None
PROFIT BEFORE TAX	121,535	260,252	239,588
ESTIMATE FOR FEDERAL INCOME TAX	60,767	130,126	119,794
NET PROFIT	60,768	130,126	119,794

Cross Co.



How Far Should You Go?

THERE IS NO hard and fast rule for deciding where you belong in the automation picture. The degree to which you can automate your plant of parts, therefore, must be handled on an individual basis. Here are some factors which will help you find out "how far you should go."

AVAILABLE CAPITAL—

Warning: don't let the initial cost stop you. Investment must be figured over the long run, and it should be compared with return.

PERSONNEL—

Evaluate your employees in terms of their part in the automation scheme. Much of your direct labor may be routed into maintenance. Be sure you can successfully operate and maintain the system you install.

SALES REQUIREMENTS—

If you're going into automation to boost production, check to see if the proposed system meets your needs. If it falls short, you haven't solved your problem, and if it over-produces your requirements, you will be looking expensive machine idle time.

WORKPIECE GEOGRAPHY—

Consider the application of automation to your product as it now stands. Also consider re-design of the part to facilitate automatic processing. Standardization of design can enhance the possibilities of creating parts with long production runs.

PLANT LAYOUT—

Automation will increase your plant production per square foot. Consider the advisability of shifting some or all of your present equipment to fit the proposed system.

what can be done is at Hickok Mfg. Co., Lyons, N. Y. Chutes holding the merchandise are operated by remote-control code machines. The operator punches keys on the machine to denote type and quantity desired. Items are released from the chutes, fall onto a conveyor belt and are carried to a packaging and shipping area. An entire order can be processed in the time it takes the operator to punch the keys.

And the Workers? — Automatic factories will not be completely workerless factories. Maintenance and supervisory personnel in a fully automatic plant will still be numerous.

But this dream factory is still below the dip in the metalworking horizon. As Roger W. Merrill, Battelle Memorial Institute, Columbus, O., puts it:

"For most manufacturing plants, automation will not spring up overnight; rather, it will evolve as improvements are made in the instruments, computers and servomechanisms. This will occur process-by-process rather than on a plant-wide basis."

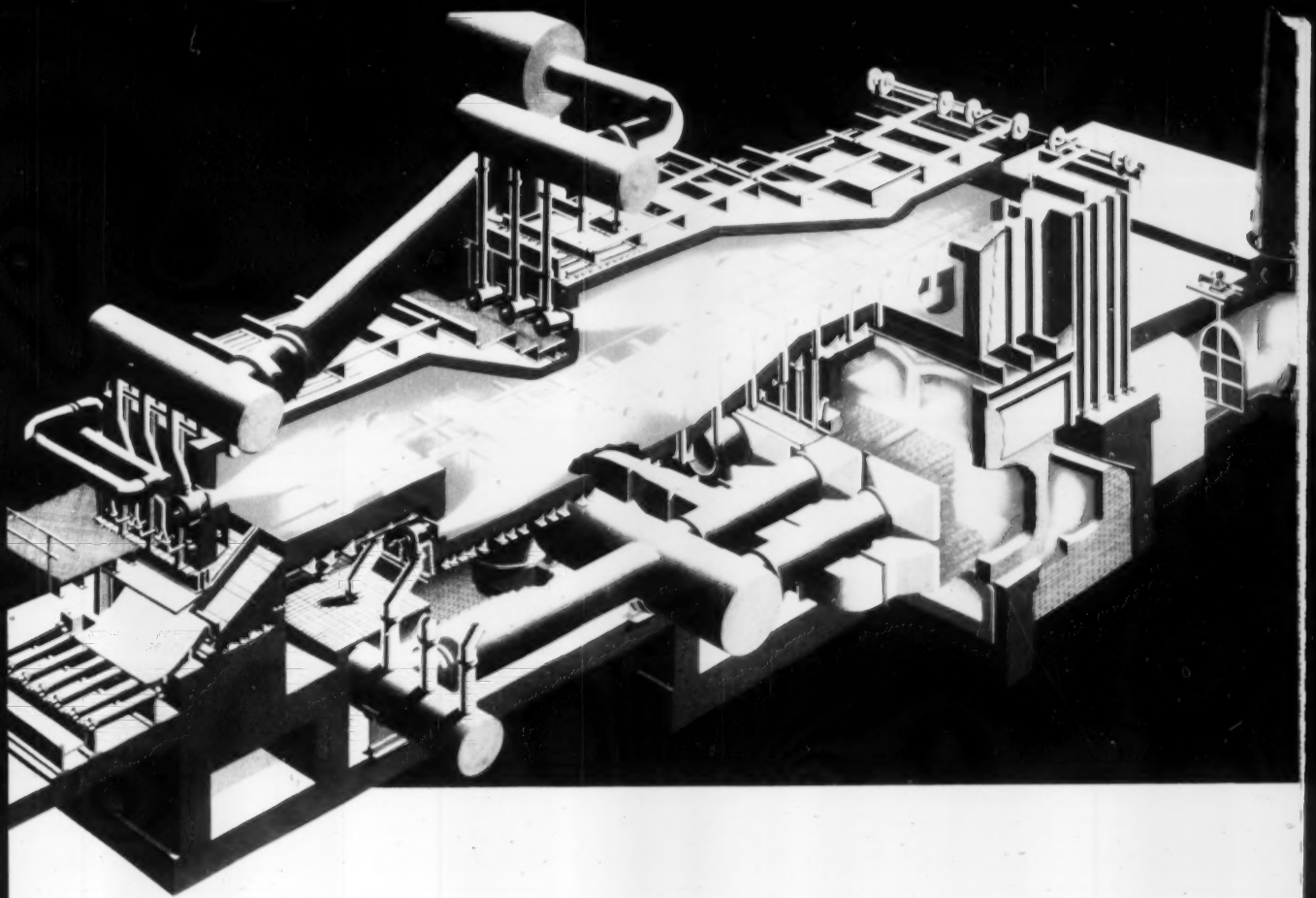
Long before the automatic factory arrives, however, much of the industrial process will be automated to a degree—from the automatic screw machine, through conveyor-linked standard machines or processes right up to the tape controlled transfer lines.

Management's decision today is how far do we go? We have passed the "should we?" stage.

The answer to this question will always vary from one job to the next, from one plant to the next. But, certainly, no revision of production plans, no purchase of new equipment should be established until the automation question is answered.

S. J. Hunt, secretary and administrative engineer, National Automatic Tool Co. Inc., Richmond, Ind., says:

". . . the trend toward further automation will continue . . . The result will be more and better goods at less money for everyone. This is an absolute fact, because it must be remembered that this equipment is bought only when the buyer knows it will make money for him."



Prime example of Salem-Brosius' furnace-engineering ability

The huge industrial furnace illustrated here attests to the superior engineering skill of Salem-Brosius. One of a few of its kind in the country, it is a pusher-type, triple-fired slab heater currently feeding the giant hot strip and sheet mills of a great steel producer. It features high capacity heating and soaking zones, heavy construction, recuperators for fuel economy, dual gas-oil fuel system, and many other advantages to assure positive, automatic control of furnace output and heating quality. *And the efficiency, economy, ease-of-operation, and trouble-free service this furnace represents are typical of all the furnaces Salem-Brosius builds.* Whether you require conventional heating or heat treating furnaces or furnaces to do an extraordinary job, Salem-Brosius offers equipment designed, engineered, and built not merely as a furnace but as a heating machine. You can purchase these furnaces as complete installations equipped with all controls, piping and wiring ready to operate.

Salem-Brosius products furnaces, forging manipulators, goggle valves, slag granulators, clay guns, charging machines, grab buckets, and special equipment are engineered for peak performance at lowest cost, because we believe that satisfied customers are our best advertisements. Before you invest in any of these products, we suggest it will pay you to call in a Salem-Brosius engineer and let him study your problem and present a proposal.

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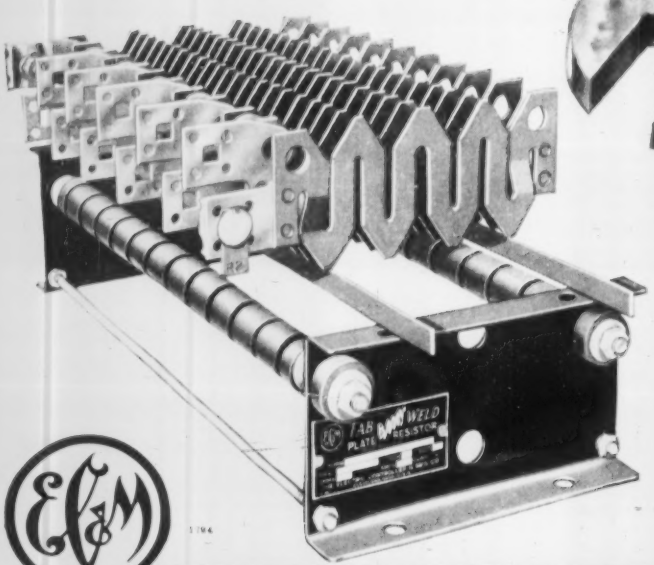
EC&M TAB-WELD RESISTORS REQUIRE MINIMUM MAINTENANCE

Only EC&M TAB WELD Plate Resistors are both bolted and welded for constant current path. Unlike other resistors, they do not require periodic tightening of clamping nuts to compensate for loss of pressure caused by alternate heating and cooling. In TAB WELD Resistors, grids are offset and mating ends spot welded. Tap-plates are also welded into place at close intervals along the grid assembly.

This exclusive EC&M construction offers these outstanding advantages: (1) stabilized ohmic value, (2) no burning at grid eyes or at tap plates, (3) easy tap shifting for best motor performance, and (4) long life with negligible service.

So . . . hands off EC&M TAB WELD Plate Resistors . . . they are constructed for dependable performance on heavy duty motor applications . . . with minimum maintenance!



CHECK THESE ADVANTAGES!

- Nonbreakable
- Corrosion-resistant alloy steel
- Negligible resistance change between cold and maximum working temperatures
- Offset resistor ends spot welded
- No burning at grid eyes
- No burning at taps
- Small adjustments in resistance value easily made
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- No periodic tightening of clamping nuts
- All standard sections same size
- Double insulation to ground
- Fast connection to any tap plate

Write today for illustrated Bulletin No. 942-B for complete data on EC&M TAB-WELD Resistors.

THE ELECTRIC CONTROLLER & MFG. CO.

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STEEL

April 12, 1954

Technical Outlook

TITANIUM— Price of this metal probably will come down when major producers hit the 10,000-pound a day mark, Tom Lippert of Titanium Metals Corp. told the ASM in Cleveland last week. TMC, says Lippert, is now producing 5000 pounds a day and has the capacity to double its output. Another reason why prices have not leveled: Government keeps making its specs tougher. Lippert said the metal made three years ago could be sold for half the price today.

CORROSION— Aqueous extracts from litharge completely inhibit corrosion of steel, according to work by M. J. Pryor, Kaiser Aluminum & Chemical Corp., Spokane, Wash. He also found that extracts from metallic lead and red lead inhibit for a short time. Extracts from basic lead carbonate, zinc and zinc oxide lead showed no protective action.

POWDER METAL LAB— Have a part you think might be made on a powder metal press? You'll soon be able to take your problems to Baldwin-Lima-Hamilton's Baldwin, Pa., lab for investigation. Still in the planning stage, equipment will include a 100-ton press, sintering furnace and all necessary lab facilities. Whether you're a potential press user or not, services will be available to all.

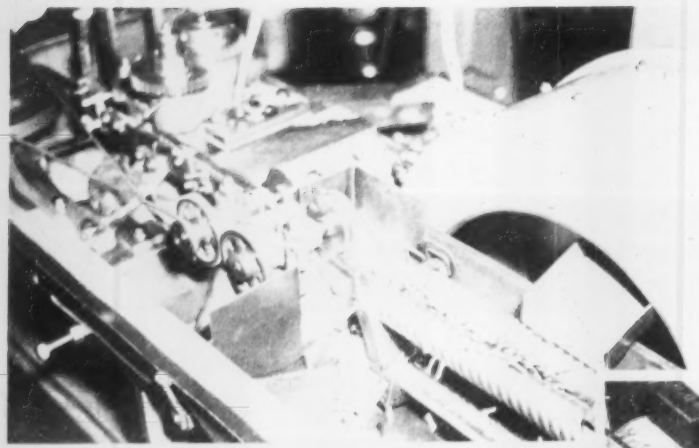
ALUMINIZED PROTECTION— After a couple of years of field testing in the hot jobs of steel plants, Minnesota Mining & Mfg. Co., through its licensed outlets, is ready to talk about its aluminumized cloth. Men wearing hoods, aprons, ponchos, sleeves, boots, etc. made of the material can work in comfort and safety for much longer periods of time. Furnace maintenance and repairs can be done, in many cases, without downtime. Hot-ingot conditioning is possible to a greater extent, saving soaking pit time. Most significant: Workers have received the safety togs enthusiastically and wear them without being prodded by safety management.

PLASTIC TOOLS— Industry will save about $30 million in labor and material on plastic tools in 1954, Dr. Robert S. Aries, consulting chemical engineer, told ASTE last week in New York. He cited a case where it takes 84 days to tool up with metal to make side panels for trucks. Plastic tools for the job are turned out in 21 days at a 50 per cent economy. Others: A large aircraft company says it's saving $2 million a year, a foundry $4000 on each of its 50-core boxes.

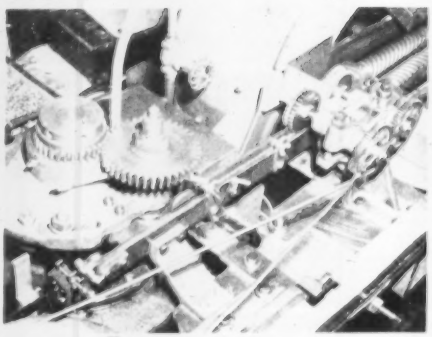
SHELL MOLDING— If you prefer solvent-type release agents to water emulsions, take a look at two new silicons developed by Dow Corning Corp. F-496 contains 5 per cent solids, F-452, 50 per cent. High-viscosity silicone fluids are in mineral spirits.

NEW LAMPS— General Electric Co.'s Lamp Division is responsible for a pair of developments of considerable significance to both production and plant service people. The first, a new type of infrared lamp, will probably be seen first in industrial radiant drying and baking ovens. In two ways it's a departure from previous units: A compact tubular shape and fused translucent quartz composition. High energy concentration, plus energy over a wide range of wave lengths, promise advantages. Also significant to industrial users is a new fluorescent lamp the division says produces 35 per cent more light than its previous light sources. A new design for the base confines it to new installations.

Metalworking Outlook p. 39 Market Outlook p. 145



Blanks are carried to delivery chute by vanes in the revolving hopper. Agitator rolls then position blanks and feed clearing wheels. Excess blanks return to hopper



Feed-in wheel gears, interchangeable according to blank size, keep feeder trough filled with blanks. Endless steel band conveys blanks to the notched feed dial

Planetary Thread

New Waterbury Farrel machine multiplies output of screws without sacrificing quality for speed. Design of reasonably-priced dies and feed mechanism opened the way

PLANETARY die and segment thread-rolling principle, as applied to a new machine completed by Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., boosts output speeds anywhere from three to fourteen times over previous machines.

Yielding from 300 to 2000 blanks per minute, depending on blank size, materials and feeding characteristics, the machine's capacity ranges from a number 6 screw to $\frac{1}{4}$-inch diameter; and the lengths range from $\frac{1}{4}$ to 3 inches with a maximum thread length of 2 inches.

Limitations—Based on a design patented by Victor H. Fray, New Zealand, the machine is primarily for production runs of 100,000 or over and applicable mainly for machine screws requiring Class 2 threads, although Class 3 are possible. Quality is equivalent to that obtained on flat die machines. Dies have not yet been commercially developed for sheet metal or gimlet pointed screws, but an early solution of this problem is foreseen.

Stainless steels have not yet been run, nor have hex-cap screws, carriage bolts and the like. The simplest blanks are standard, round, button, pan truss and flat heads of medium lengths. Long blanks run somewhat slower due to arranging problems in feeding.

Not a New Idea — While most thread rolling is done with flat reciprocating and two or three roll cylindrical dies, the idea of planetary dies is not a new one. WF cataloged such a machine, hand-fed, in 1888 and hoppers were developed for them in the 1890's. Real development headaches lay in the manufacture of the dies at reasonable prices and devising a feed to keep up with the phenom-

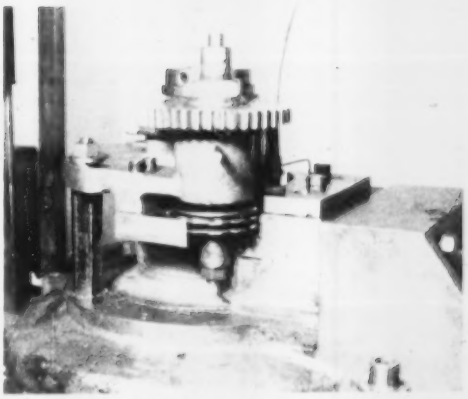
enal operating speeds possible.

Like flat reciprocating dies, flat discs are placed under or over the cylindrical die to locate the threads on blanks not rolled to the head. Standard die faces are $1\frac{1}{8}$ and $2\frac{1}{4}$ inches. Two segments and one cylindrical die form a set capable of rolling up to six or more million blanks as indicated in service tests.

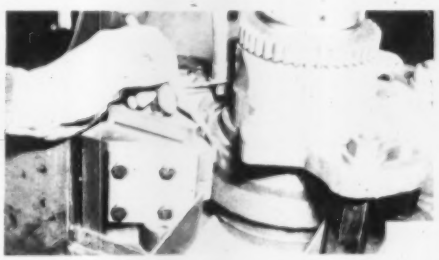
How It Works — The feeding mechanism consists of a drum hopper, agitator or sorting rolls, clearing wheels and an endless steel conveyor belt. The whole mechanism, excepting the hopper drum, may be swung out to provide easy access to the dies and necessary tooling and speed changes.

Hopper is revolved at $2\frac{1}{2}$ to 8 rpm and, like a water wheel, elevates blanks to a delivery chute which empties them over sorting rollers where the blanks are positioned shanks down between the feed chutes. Between these rolls and the front clearing wheel, reject blanks not properly positioned or in excess fall down an inclined chute into the hopper bowl where they may be fed over again.

Purpose of the second clearing wheel running clockwise is to assist blanks in getting properly under the closely guiding chute cover and to prevent the heads of blanks from climbing over one another.



Feed-in wheel shaft of threader in action. By changing top gears, shaft speed and feed-in rate can be adjusted. Feeder carriage can be swung out for easy access. Safety guards have been removed to show the details



Closeup of planetary thread rolling die in process of threading blanks. Coolant enters from flexible base in center. The rigid construction minimizes the shaft deflection

Die at right has rolled some 750,000 screws without visible signs of wear

Rolling . . . Up to 2000 Blanks Per Minute

Feeder Guides—Along side of the outer chute is the fast traveling steel belt which moves the blanks along quickly by contact under the heads of blanks and the shanks as well. Inner chute is the secondary guide leading up to the position of the feed-in wheel which, with proper notches, picks out the blanks from the chute and rotates them between this wheel and outer guide in between the main roll and segment die. This later is notched to admit the feed-in wheel.

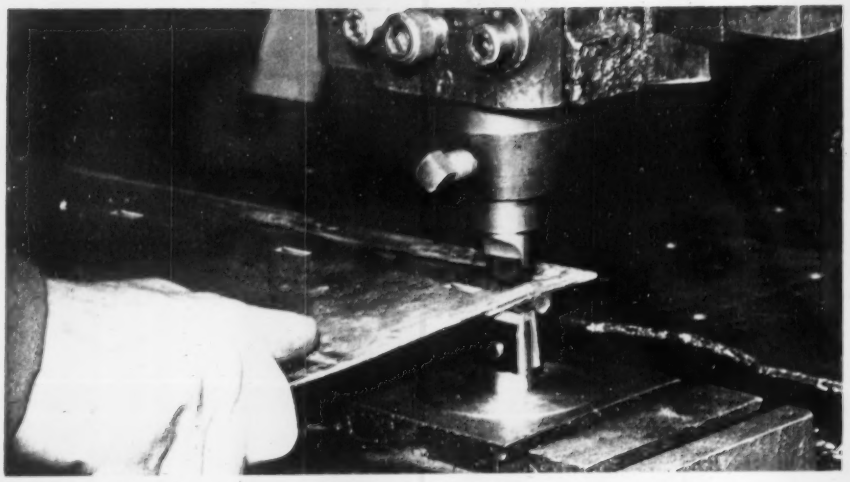
For short or difficult-to-feed blanks, a spring plate or other device keeps the blanks down against the feed-in wheel so that heads are always flush with the top of the dies or filler pieces. After passing through the planetary dies the blanks are stripped or dropped into a chute which carries them to a tote pan.

Cooling and Coolants — Various coolants have been used from pure lard oil to Cim cool the latter in 10 to 1 mixture with water. Coolant and die wash are forced between the dies by a centrifugal pump next to the base of the machine. The coolant capacity is 50 gallons. Four individual motors drive the die spindle, hopper, feed and coolant pump. All controls are centralized in a panel control box and interlocked for safety.

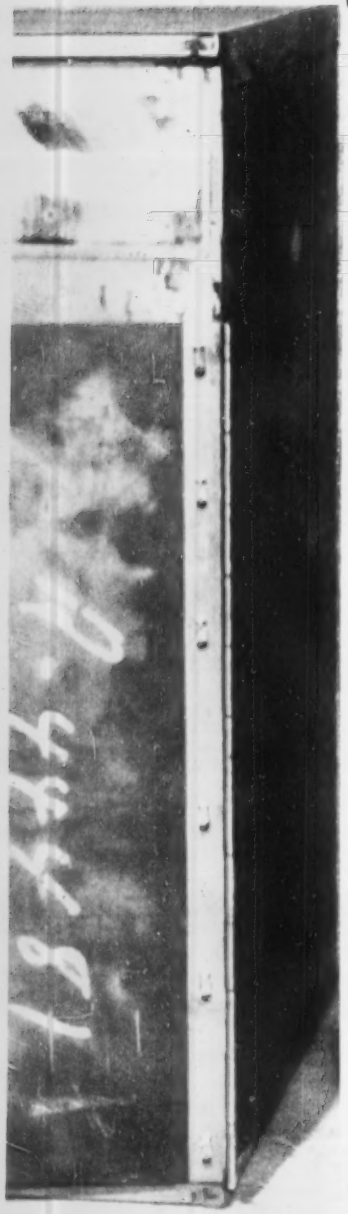
The complete change of dies, setup and adjustments requires about $1\frac{1}{2}$ hours. No change is required for minor differentials in length; only a pressure adjustment may be needed for different materials.

Economies — Since one machine will do the work of from 4 to 14 flat die threaders and one operator can easily take care of two machines, several economies are immediately in evidence. Operator can concentrate on a single machine more readily than on a row of machines.

With blanks rolling more times through their die path, the threads are more easily formed and the greater die life compensates for the greater cost.



Otis uses Metalace process for fastening hinges to sheet steel bank cabinet doors. Punch press at right was easily adapted to perform the operation. Photograph below shows an assembled cabinet and rectangular "laces"



Fastening Costs

TAKE A NOSE DIVE

These two sheet metal fabricators, with the help of Metalacing punches and dies, are buttoning up substantial savings in time and materials

TWO West Coast sheet metal fabricators, each a large-volume producer of consumer items, are totalling up significant savings in joining costs, thanks to a unique process. Called Metalacing, the technique involves shearing, drawing and upsetting of metal on both parts in such a way as to form a tight bond without the addition of another element.

Crockatt Engineering Co., San Francisco, holds the patents on the tools a specially-designed punch and die set and they have licensing agreements with manufacturers who produce and sell them.

How It Works—Actual fastening occurs when the shearing action of the punch creates a parallel double incision in the metal sheets being worked. The strip of metal between these incisions is rammed downward, against the anvil of the die beneath the sheets and between the die's movable jaws.

There the impact spreads the depressed metal sideways, creating a permanent fastening wedge or button under the surface of the bottom sheet. Strength of the fastening, according to Crockatt officials, is comparable to rivets.

Saves Materials—One firm, the Frank Pollard Co., San Leandro, Calif., makes aluminum clothes drying poles and the flanged, tubular ground boxes in which poles rest and revolve. It was in the making of these ground boxes that

Pollard realized more than 22 per cent savings in material alone. Formerly they spot-welded two halves of the boxes together. This meant clean, new metal had to be used, a factor that pushed finished costs higher.

With Metalacing, Pollard production officials report they are able to use prepainted scrap metal of the same gage that is from 2 to 2½ cents per pound cheaper. This adds up, they say, to the 22 per cent mentioned above.

"We also save time with Metalacing because we no longer have to pickle the ground box halves before fastening them together. Formerly oil was used as lubrication in the forming process and had to be removed prior to spot welding. Now we just take the metalaced box and pickle and paint it," report Pollard officials.

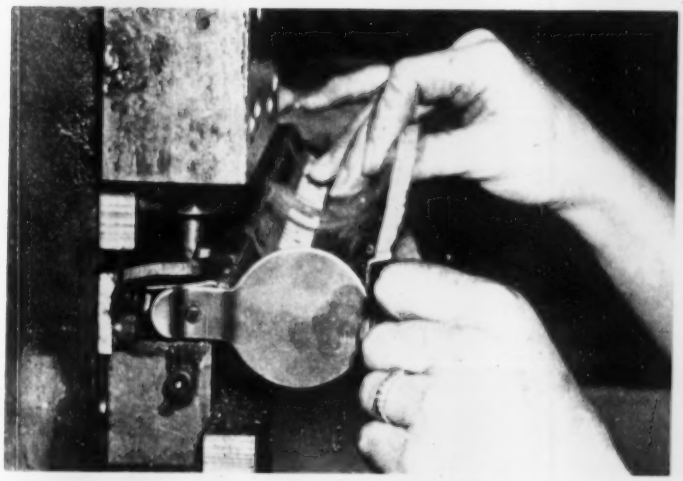
Sixty Per Cent Faster—That's the report of Otis Sheet Metal Inc., San Francisco, which uses Metalacing in the manufacture of their metal bank cabinets. "Just by inserting punches and dies in our regular punch press we converted it to metal fastening duty," reports Otis president, Erik Skovgaard.

Formerly hinges were riveted to cabinet doors. This meant three separate operations: Punching holes in the hinge plate, punching matching holes in the steel doors, and then inserting and flattening the rivets. Metalacing does the job in one step.

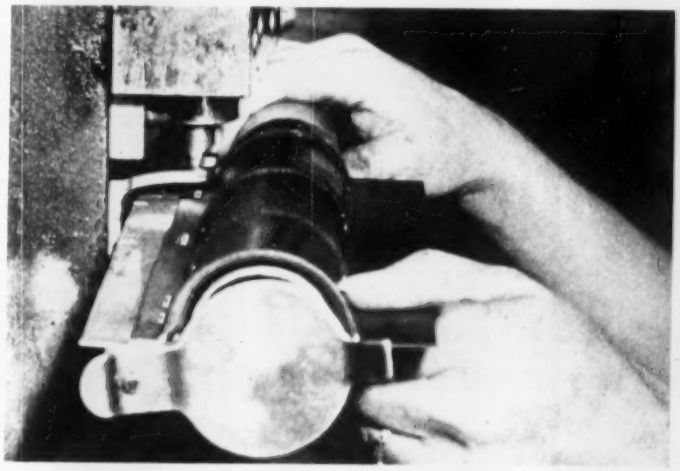
Where Metalacing proved to be 60 per cent faster than riveting in fastening 14-gage continuous steel hinge to the 11-gage sheet steel doors the method proved even faster on parts where welding was formerly used, according to Otis production men.

Size Range—Tools are available in a range of sizes that will fasten sheet metal up to ¼ inch thick. In most cases, existing hydraulic presses can be quickly adapted to fastening by insertion of the punch and die set. Best results are obtained with foot-operated presses which leave operator's hands free to handle the work.

Crockatt estimates that there are more than 270,000 presses in American industry that are suitable for Metalacing operations.

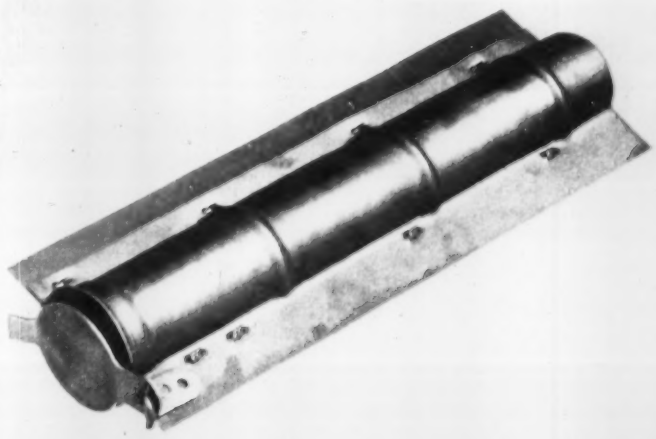


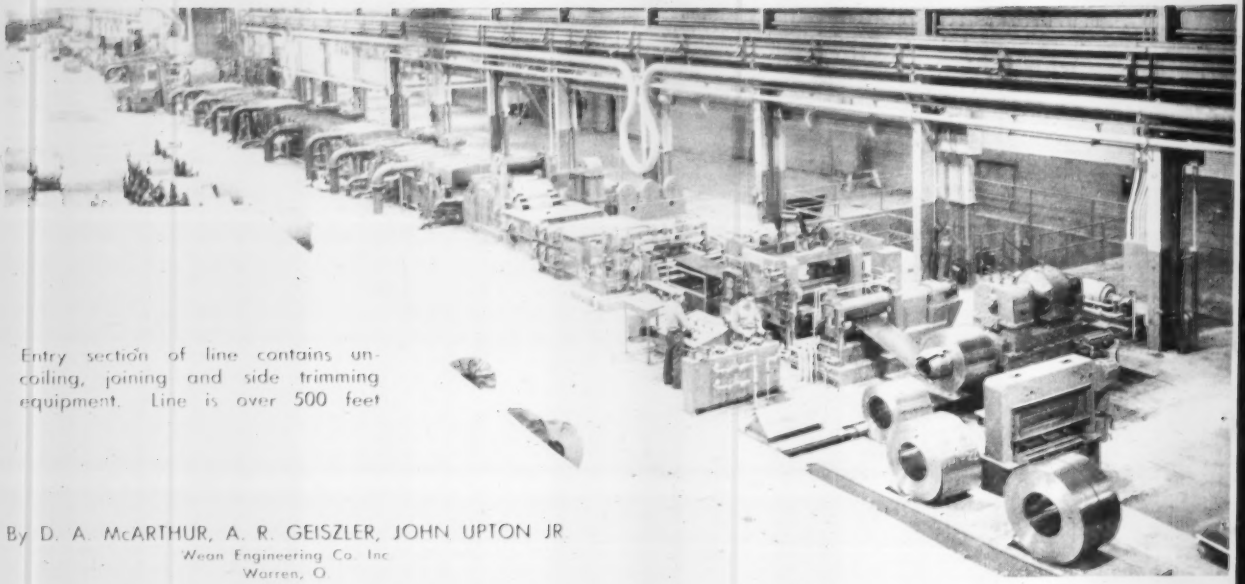
First step in assembling ground boxes at Pollard Co. is to fasten the cover flap to one half of the box



Then the operator "laces" the other half to the assembly by split-second blows along flanges of the box

Finished product looks like this. Pollard can now use cheaper, prepainted metal since they no longer weld





Entry section of line contains uncoiling, joining and side trimming equipment. Line is over 500 feet

By D. A. McARTHUR, A. R. GEISZLER, JOHN UPTON JR.
Weon Engineering Co. Inc
Warren, O.

Continuous Galvanizing Line

DESIGN IS KEY TO SIMPLE CONTROLS

PART 2

This is the second of a two-part series on this new line. Article last week described the line in detail.

Division of line into three sections affords excellent arrangement for good control system. Close speed regulation between sections for synchronization is eliminated

DIVISION of Wheeling Steel Corp.'s continuous strip galvanizing line at Martins Ferry (entry, processing and exit sections) is an ideal arrangement for a relatively simple yet good control system. Necessity of close speed regulation between sections to maintain synchronization is eliminated.

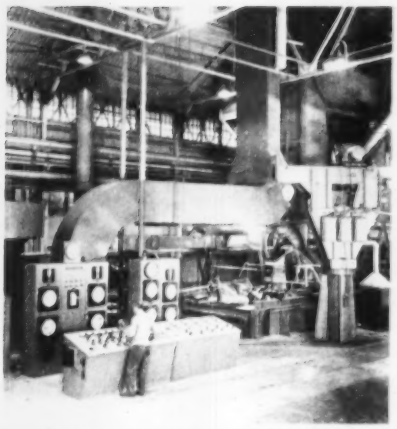
As in all processing lines, it is essential that speed synchronization between drive motors imparting power to the strip within a section must be maintained.

Drives All dc motors, except the one for the scrap baler, are connected to a variable voltage system, which is further subdivided into four generators: One for the entry section; one for the processing section; one for the reel, which is transferred to the flying shear when shearing and piling; and one for the piling section.

Basic characteristic of this type line is constant torque rather than constant horsepower. Entire line speed range of 6 to 1 is obtained by armature voltage, permitting use of constant-speed, dc motors suitable for constant torque operation over the entire 6 to 1 range.

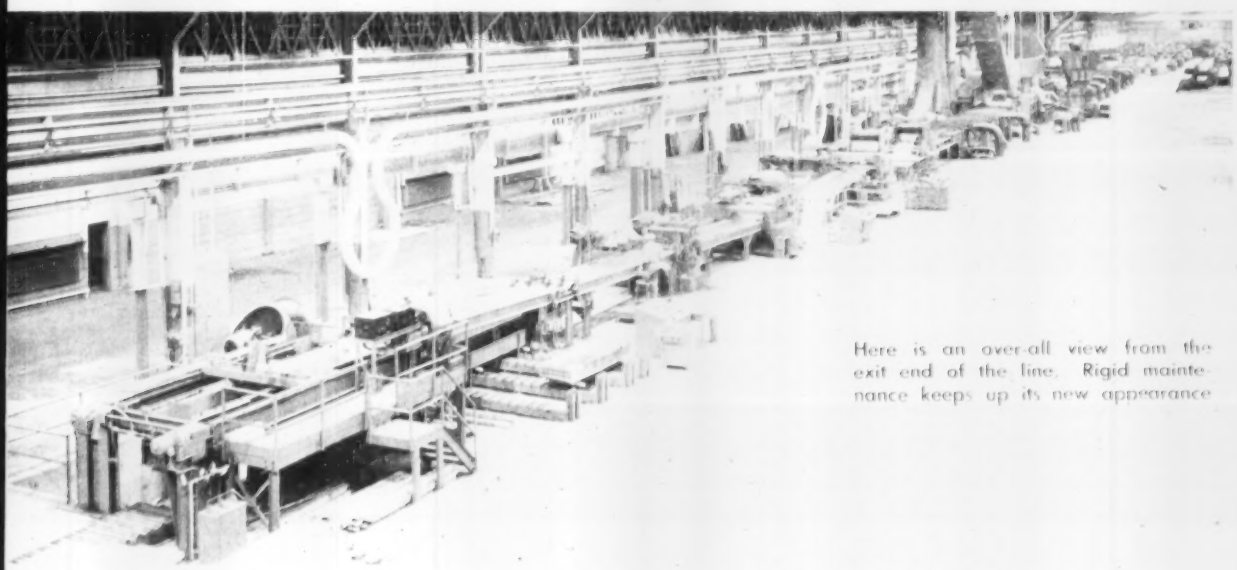
Only exceptions are the coil holder and tension reel. Here additional motor speed range is required for coil build-down and build-up.

Controls—Excitation to each of the four generators is controlled by motor-operated rheostats; each incorporates a preset speed dial which automatically brings the several sections to the pre-selected speed established by the main operator with a small, preset speed rheostat on the main desk. Any slight mis-match in speed between sections, inherent in the system, is overcome by the regulating range of the photo-electric loop controls between sections.



This area includes the pot, flux drying and strip cooling equipment. The pot is heated by induction

Electrical control room is on a balcony adjacent to the line. Portion of the dc equipment can be seen



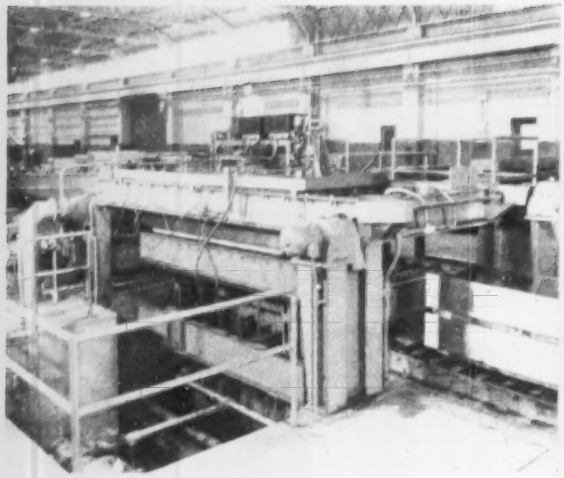
Here is an over-all view from the exit end of the line. Rigid maintenance keeps up its new appearance

Since there are two loops in the entry section, control is so arranged that the photo-electric controls of the shallow loop preceding the side trimmer operate into the field of a booster in the welder pinch roll armature circuit. Any change in the position of this loop affects the speed of the welder pinch roll and the speed at which strip is removed from the coil holder.

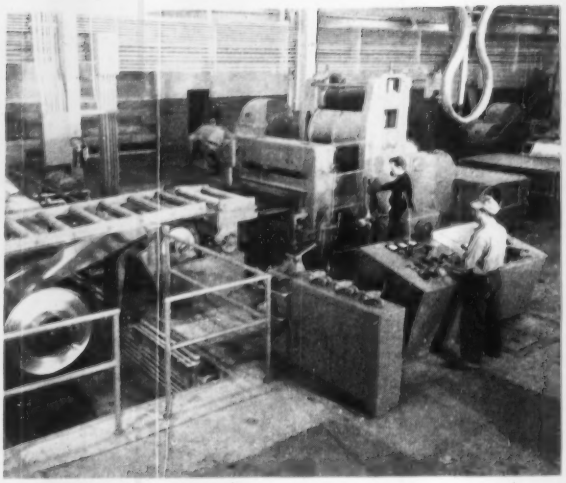
These changes are reflected as differences in tension in the strip from the coil holder; however, the tension regulator associated with the coil holder immediately adjusts the coil holder motor field to maintain constant tension. The second loop associated with the entry section is the number one, deep strip storage pit. Since the process section is normally operated at a constant speed, the regulator for this loop operates into an auxiliary field of the entry generator to vary its bus voltage, as commanded by this loop generator.

Processing—For any strip width and gage this section is normally operated continually and at a constant speed. Since the motoring load under this condition is relatively constant, no speed regulators are incorporated; but the process section generator has a rotating-type voltage regulator, and the main drive bridle sets the speed for this section. To avoid strip slackness, which could cause scratching and produce irregular coating weights, a tension regulator for the drag bridle maintains constant tension.

Exit—Here the section for recoiling operates from one main generator. Its main field is controlled by a motor-driven rheostat, with the preset speed function. The generator's auxiliary field is under the photo-electric control of the number two, deep looping pit. A normal, rotating-type tension



Piles are squarely stacked by this primer piler. It includes staggering device for the piling of packs



Here a coil is being wound on the reel at the exit end of the line. Coil car removes completed rolls

regulator for the reel maintains uniform recoiling tension.

To assure the winding of a straight coil, a pneumatic-type, edge-positioning control unit is provided. When shearing and piling, the bridle (previously acting as a drag bridle to establish rewind tension when recoiling) now operates as a feeding unit to feed strip into a second, shallow-regulating loop. It immediately precedes the flying shear. Since this drag bridle is now motoring at a light load, the photo-electric loop controls of the shallow loop operate directly into the bridle motor field to maintain the shallow loop position.

Piling generator supplying power to several belt conveyors and the leveler is also a two-field generator. The main field is under motor-operated rheostat control, similar to the exit generator; the auxiliary field is connected into the same number two, deep looping pit, photo-electric controller as the exit generator auxiliary field. With this arrangement, the position of the loop in the number two, deep looping pit regulates the speed of all drives in the exit section; it automatically provides over-speed of this section, when the number two, deep loop pit has become partially filled because of exit section stoppage to remove a prime pack.

Others—A drive may be provided for coating rolls on the galvanizing pot. This system would have a special, high starting torque motor connected to a special generator. Control may be arranged to give the operator complete control of coating roll speeds relative to the line speed. This drive also may be arranged to rotate the rolls at reduced speeds, when the process section of the line is stopped. This would decrease the possibility of rolls freezing in their bearings.

The pre-melt and main pots, heated by 60-cycle, multi-inductor coils, are provided with high-power, low power controls and an elaborate alarm system.

Auxiliaries—A line of this type also requires numerous ac auxiliary drives for fans, pumps, adjusting mechanisms, etc. Aggregate horsepower is about 500 not including drive motors for motor-generator sets. To control ac motors, modern enclosed control centers, with incoming line reactors to limit fault current within the control center structure, and motor feeder lines to 15,000 amps were used. Control center, in a standard, 90-inch high structure, is a panel 55 feet long.

Balcony—Controls, regulating, booster and variable voltage motor-generator sets are installed in a control balcony. Floor is at an elevation above flood level.

Main conduit runs emerge from this control balcony and run lengthwise to the line supported on the building columns again at a higher-than-flood level. Minimum conduit and cable are embedded in the floor.

Specials—Several other items deserve mention. First is the complete absence of fumes from surface preparation, coating or chemical treating sections of the line. All tanks have covers and fume exhaust systems, complete with fans and fume washers.

Exhausting equipment for the pot and flux tanks is constructed of stainless steel, to withstand corrosive action of some fumes. Fume exhaust systems from all tanks that may contain acid are rubber lined. Success of these systems is proved by the completely clear atmosphere at all times throught the building.

Wheeling Steel Corp.'s color code system has given the line a pleasing appearance. After several months operation, it still has its first-day look because of rigid maintenance, which includes a schedule of repainting.

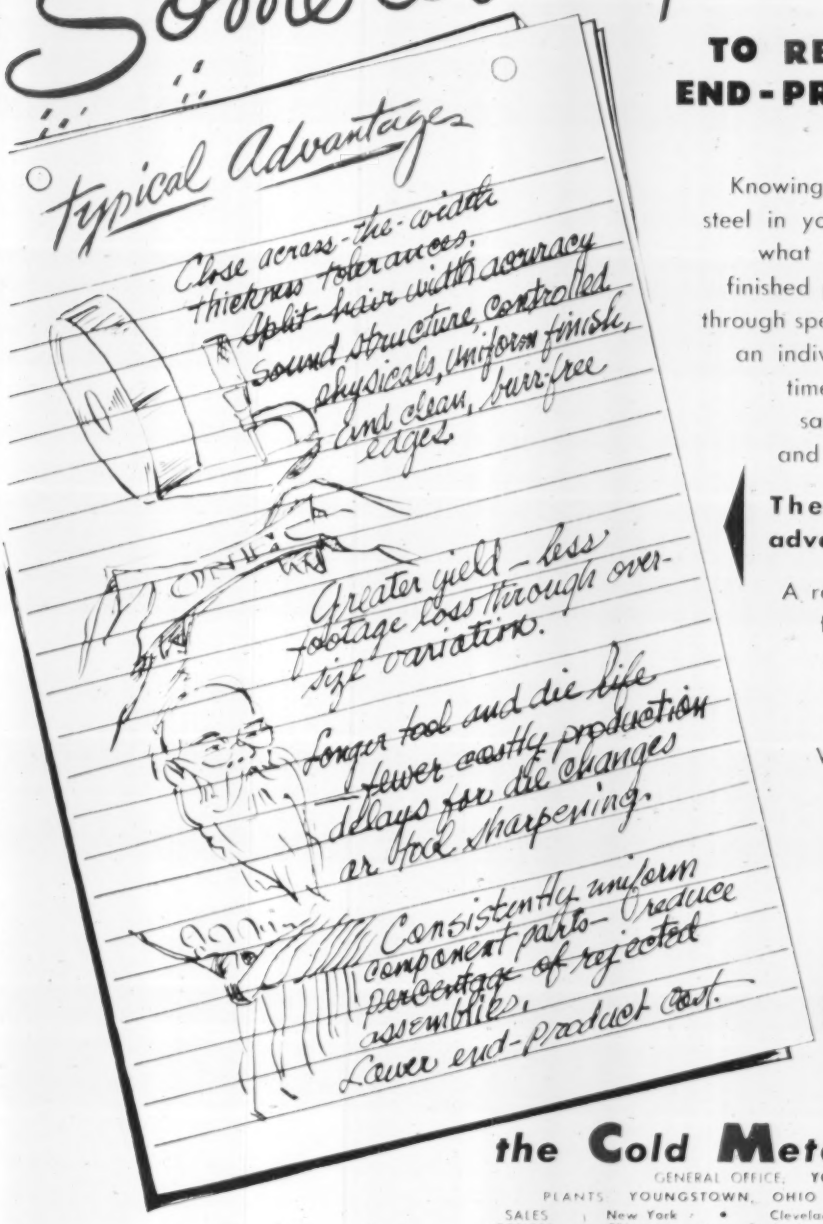
General contract for the line, completely installed, was placed by Wheeling with the Wean Engineering Co. Their principal subcontractors were the Westinghouse Electric Corp. for all electrical equipment and the McDowell Co. for installation. Dingle-Clark Co. and Kaighin and Hughes were subcontractors under McDowell. Ajax Engineering Corp. furnished the two induction pots.

CMP

COLD ROLLED STRIP STEEL OFFERS

Some Wonderful Ways

TO REDUCE END-PRODUCT COSTS


Typical Advantages
Close across-the-width thickness tolerances.
Split-hair width accuracy
Sound structure, controlled physicals, uniform finish.
Clean, burr-free edges.
Greater yield – less footage loss through over-size variations.
Longer tool and die life – fewer costly production delays for die changes or tool sharpening.
Consistently uniform component parts – reduce percentage of rejected assemblies.
Lower end-product cost.

Knowing how you use cold rolled strip steel in your fabricating operations and what it is called upon to do in the finished product . . . CMP can develop through special processing for those needs an individual strip product that many times makes possible important savings in fabricating, assembly and end-product costs.

These are some of the advantages you can count on

A review of your strip steel specifications in terms of what CMP precision strip steel can do for your product betterment may prove mutually advantageous. We will welcome your invitation to call.

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the Cold Metal Products co.

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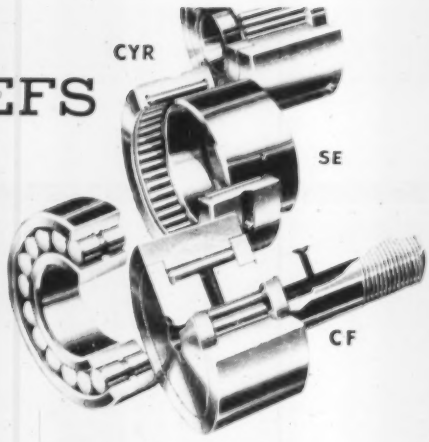
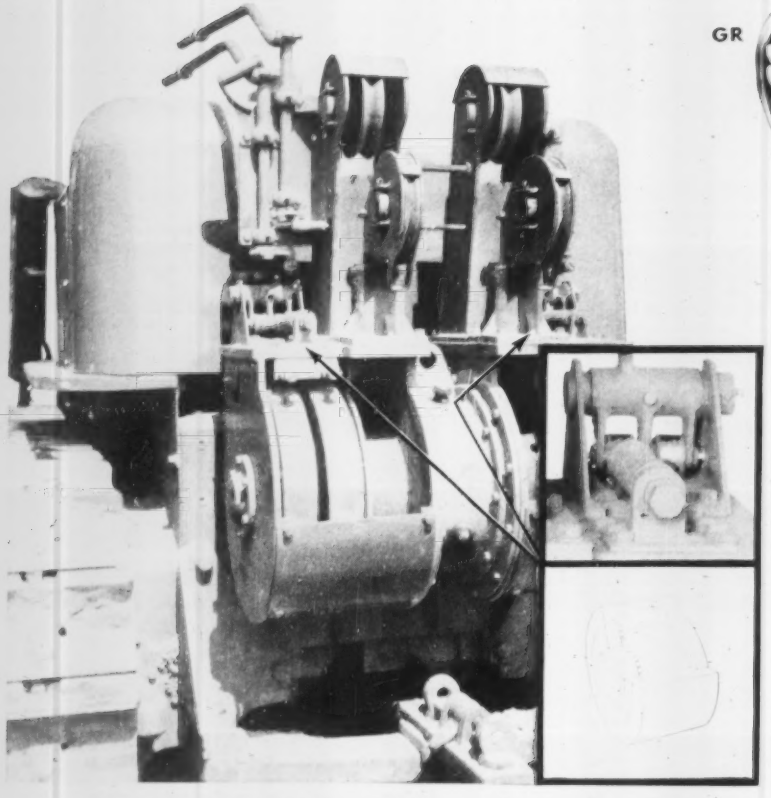
(Advertisement)

McGILL BEARING BRIEFS



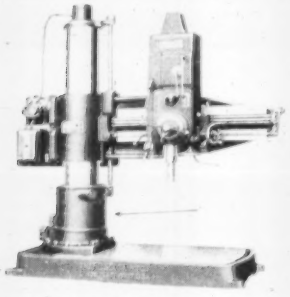


"MULTIROL" CYR Bearings HELP PROVIDE "POSITIVE ACCURATE CABLE CONTROL" on GarWood Cable Control Units

It takes dependable, precision bearings to achieve the "fast, accurate control" featured in Gar Wood Cable Control Units. That's why Gar Wood has standardized on Multirol CYR Bearings as cam rollers on the control arms. The Model 281 unit uses 4 CYR bearings to enable precise, frictionless adjustment of control cables on each of two drums that handle a scraper or dozer blade. CYR Bearings have a thick outer race section to withstand the heavy shock loads encountered in such cam applications. They help make the Gar Wood Cable Control a rugged, hard-working unit that stops and starts smoothly.

Multirol CYR Bearings are built to provide longer life and greater efficiency in cam operations. They are labyrinth sealed by roller retaining end plates tightly fitted and secured to the shoulders of the inner ring. Yoke mounting is possible where desirable on shaft sizes ranging from $\frac{1}{4}$" to $1\frac{1}{4}$" for corresponding roller diameters of $\frac{3}{4}$" to 4".

FOSDICK DRILL HEADS POSITIONED BY CYR BEARINGS



Fosdick Machine Tool Company uses Multirol CYR Bearings to provide rigid and accurate support between inner and outer columns of this Hydraulic Radial Drill. The CYR Bearings act as guide rollers between columns to provide precision positioning of the drill head.

CYR BEARINGS REDUCE FRICTION ON VALVAIR VALVES

Changing the cam roller on this Valvair 4-way cam operated valve to a Multirol CYR Bearing reduced friction on the cam plate and eliminated elongation of the hole in the cam arm. Since replacing friction type rollers with CYR Bearings, they have never had occasion to replace either the cam roller or the cam arm.

BEARING SELECTION GUIDE

A new 140-page Bearing Selection Guide, complete with 30 pages of vital engineering data, has been released by the McGill Manufacturing Co. Ask for Catalog No. 52.

McGILL® —Precision Bearings

McGILL MANUFACTURING COMPANY, INC.
301 N. Lafayette Street, Valparaiso, Indiana

Reactor Temperature Gage

To do the job, Argonne's device is only slightly larger than a hypodermic needle

THERMOCOUPLE developed at Argonne National Laboratory, Lemont, Ill., makes possible temperature measurements inside the fuel elements of operating nuclear reactors. Measurement is possible because the device is slightly thicker than a standard hypodermic needle.

Because of its thinness, flexibility and ruggedness, it can be threaded through small and winding passageways into places which cannot be reached by conventional thermocouples.

Twice the Voltage—Temperature difference when two dissimilar metals are exposed to heat source creates electric current.

Sensitivity of a thermocouple is dependent on the highest millivoltage generated at a given temperature, and it must be reliable in indicating accurately the temperature readings during repeated temperature changes. The electromotive force generated in the Argonne-developed thermocouple is reported to be twice that developed in the more conventional industrial types.

Construction—The thermocouple construction consists mainly in inserting a thin insulated constantan wire into a small diameter inconel tube of the hypodermic needle type and drawing the tube through a die on a draw-bench. This grips and seals the wire within the tube. The inconel tube and the constantan wire, being dissimilar materials, comprise the couple components.

Fabrication of the thermocouple is completed by fusing the wire and tubing at one end. By using the wire and tube type of construction, the Argonne scientists were able to reduce the diameter of the couple; by utilizing the inconel tube which does not corrode easily, need for an over-all protective tube was eliminated.

Thermocouples which are 0.040 inch in diameter and 20 feet in length have been constructed and used by Argonne scientists to detect and record temperatures up to 1250 F.

Coming Next Week (April 19)

STEEL's

TOOL SHOW ISSUE

- ☑ READ—about the tool engineer's new role on the management team
- ☑ READ—what the leading tool and die materials manufacturers are doing to meet the challenge of lower costs and improved performance in a Special Forum
- ☑ READ—about putting efficiency into the design of jigs and fixtures
- ☑ READ—what tool engineers and exhibitors will be doing at the ASTE show

These 21 Experts Will Report in the Special Tool and Die Materials Forum:

L. V. KLAYBOR
Allegheny Ludlum Steel Corp.

J. Y. RIEDEL
Bethlehem Steel Co.

H. JAMES RENAUD
Ren-ite Plastics Inc.

W. L. KENNICOTT
Kennametal Inc.

G. V. LUERSSEN
Carpenter Steel Co.

C. T. FLETCHER
Braeburn Alloy Steel Co.

K. R. BEARDSLEE
Carboloy Dept. of G.E.

JACOB S. DISSTON JR.
Henry Disston & Sons Inc.

G. K. SIMONDS JR.
Simonds Saw & Steel Co.

T. G. BARNES
Firth Sterling Inc.

FRANK B. RACKLEY
Jessop Steel Co.

H. M. GIVENS JR.
Crucible Steel Co.

GEORGE A. ROBERTS
Vanadium Alloys Steel Co.

E. J. REITLER
Carbidie Inc.

ARTHUR T. CLARAGE
Columbia Tool Steel Co.

DAVID J. GILES
Latrobe Steel Co.

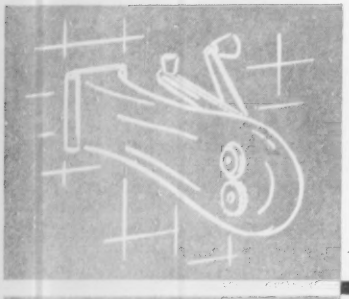
H. E. REPLOGLE
Universal-Cyclops Steel Corp.

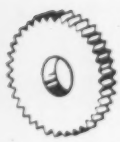
DALE KNEPP
Kish Resin Inc.

CARL BERNDT
Timken Roller Bearing Co.

HARRY W. HIGHRITER
Vascaloy-Ramet Corp.

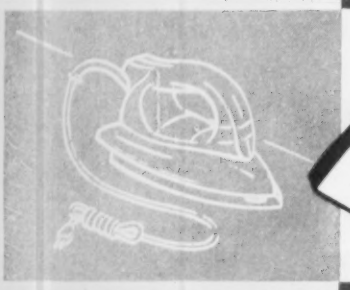
FRANK L. BOGART
Marblette Corp.

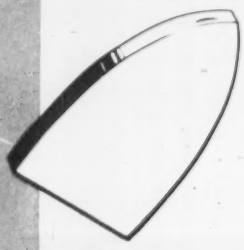




DETROIT BROACH TOOLS CAN OPENER WHEEL

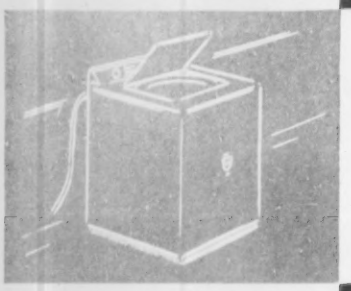
The serrations on the gripper wheel of can openers are produced with Detroit Broach tooling. While taking a big bite out of production costs, broaching produces sharp teeth with consistent form that requires no additional machining.





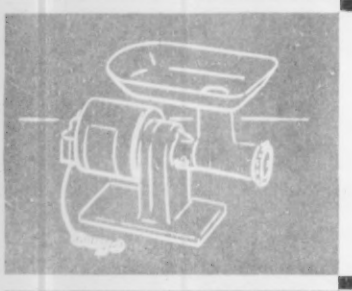
DETROIT BROACH TOOLS FLAT IRON SHOE

In one fast pass, Detroit Broach tooling machines the faces of these shoe castings sufficiently smooth and flat that only an additional buffing operation is required. On such castings of iron or aluminum, output is high and money is saved.



DETROIT BROACH TOOLS WASHER QUADRANT

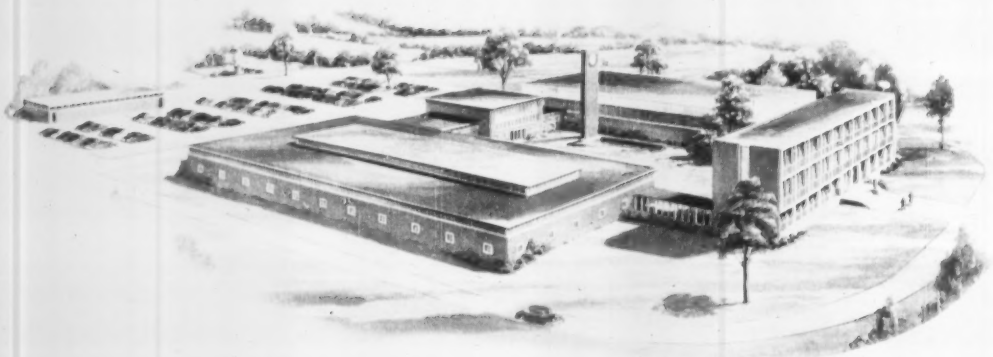
Detroit Broach tooling produces twelve involute teeth in washer quadrant castings with a $\frac{7}{32}$" depth of cut; accuracy of the involute is easily held within .001". In addition to accuracy, broaching is washing the spots off previous production figures.



DETROIT BROACH TOOLS GRINDER BLADE

Producing the internal tooth form in meat grinder blades would be a slow task by any method other than broaching. But Detroit Broach tooling produces the entire form in one pass with a surface finish so smooth that no additional finishing is required.

This is a view of the new, ultra modern Detroit Broach plant and offices located in Rochester, Michigan just outside Detroit. Designed by Sture Frolen, eminent Swedish architect, it embodies many important advancements that contribute to employee morale and manufacturing efficiency. Another example of the unusual facilities of Detroit Broach Company.



Broaching Pioneers

IN THE APPLIANCE INDUSTRY

Thanks to the ingenuity of America's appliance industry, today's housewife has been elevated from the status of hand laborer to that of a skilled technician. In every phase of her daily housework, mechanical and electrical tools lighten her work and shorten her working hours.

To bring these worksavers within the reach of the *average* housewife has called for the application of the most economical production techniques. And that is why the appliance industry has long relied upon Detroit Broach tooling to help them shave costs while maintaining a high level of quality. At the left are four examples.

in YOUR industry, too,

you will find countless examples of Detroit Broach tooling that is putting the squeeze on manufacturing costs. At the same time it consistently raises production output per man with automatic repetitive accuracy.

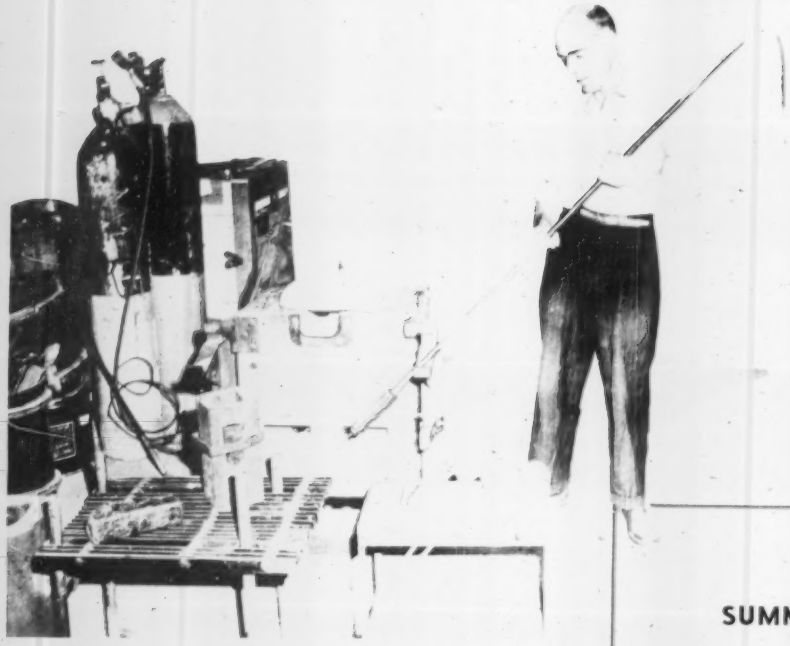
Part of the reason for the performance of Detroit Broach tooling is due to the fact that our entire efforts and facilities are keyed exclusively to this one machining technique. Another reason is our conviction that the conventional approach is not always the best approach . . . we point to some of broaching's great advancements as evidence.

Why not investigate the all-round economies that these facilities and this thinking can achieve in your plant. There is a Detroit Broach representative in your locality who can give you all the answers. Drop us a line and we'll have him call at your convenience.

Detroit Broach COMPANY

ROCHESTER, MICHIGAN

OFFICES IN PRINCIPAL CITIES THROUGHOUT THE WORLD



Furnace, sampling devices and platinum-rhodium thermocouple used for the investigation are shown. Gas bottles at the left were used when controlled atmosphere was desired

Desulphurization with RARE EARTHS

Some new test data add importance to rare earths in this role. Some heats have had better than 90 per cent desulphurization, but slowing reversion time is the real problem

CURRENT interest in steels treated with rare earth metals and their compounds probably parallels the picture of fifteen years ago concerning the use of boron in steels.

Some of the advantages of steels treated with rare earth additions have been demonstrated using specific grades or types of steel; however, one important controversial aspect of the problem pertaining to the desulphurization phenomenon could use any additional factual information or data to help establish and clarify the desulphurization effects displayed by the rare earth metals.

The Program—To study some of the fundamentals governing the rare earth-sulphur reaction in liquid steel, the following general procedure was used: Induction furnace heats were melted to the desired car-

SUMMARY OF RESULTS

1. Rapid desulphurization (followed by some type of sulphur reversion) was obtained when rare earth metals were added to carbon steels produced in basic-lined induction furnace melts.

2. Desulphurization occurred in both deoxidized and non-deoxidized steels. Sulphur drop was less in undeoxidized steels. Carbon content apparently has no significant influence on desulphurization results. No significant difference was noted when either aluminum or ferro silicon was the deoxidizer.

3. Initial sulphur drop was followed by fast reversion whenever temperature was relatively high and minimum sulphur content high. Low holding temperatures and low minimum sulphur favored a condition of fairly constant sulphur content for a time before final reversion began.

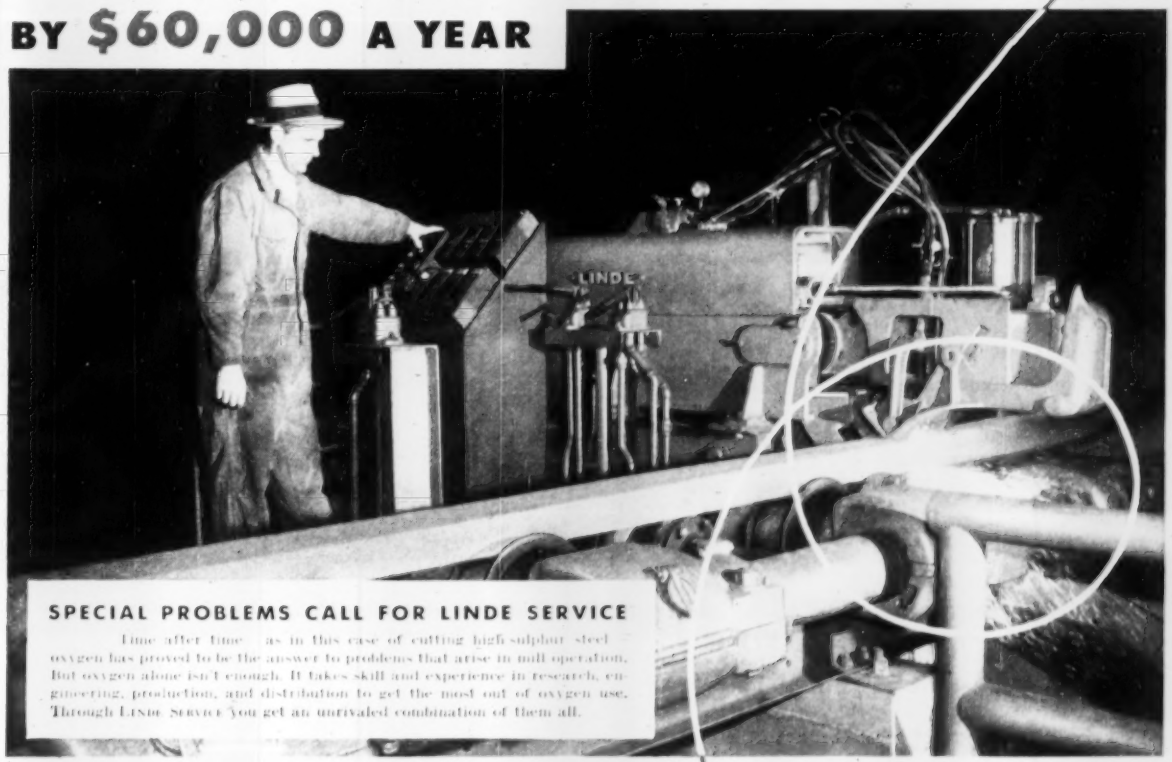
4. Under oxidizing or air atmosphere, sulphur reversion occurs until practically the original sulphur content is restored. Under neutral or natural gas atmospheres, limiting sulphur content after reversion was lower than the original content.

5. Rare earth misch metals (L-metal and an 80 per cent lanthanum lancer-amp) produced practically equivalent desulphurization under test conditions.

6. X-ray diffraction analyses indicate a CeO type crystalline component as one of the constituent phases in slag scum samples obtained after sulphur reversion takes place.

How Oxygen . . . and LINDE SERVICE*

HELPED A STEEL MILL CUT "CROP LOSS" BY $60,000 A YEAR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SPECIAL PROBLEMS CALL FOR LINDE SERVICE
Time after time . . . as in this case of cutting high-sulphur steel . . . oxygen has proved to be the answer to problems that arise in mill operation. But oxygen alone isn't enough. It takes skill and experience in research, engineering, production, and distribution to get the most out of oxygen use. Through LINDE SERVICE you get an unrivaled combination of them all.

The 4" x 4" billets coming from a rolling mill in a large steel plant are 140 feet long. They must be cut to shorter length for transfer to the next mill.

Because the billets are high-sulphur steel, conventional shearing resulted in split ends. More than 100 tons of steel per month were being lost in cropping the defective ends. Production was slowed.

Then LINDE SERVICE stepped in. Working with the mill people, LINDE engineers designed and installed a high-speed oxy-acetylene flame cutting system. Result? No more split ends . . . billets are now cut quickly and cleanly. A production bottleneck was broken. The mill figures it is saving at least $60,000 a year.

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is the unique combination of research, engineering, and over 40 years of accumulated know-how that is helping LINDE customers save money and improve production in their uses of oxygen and oxy-acetylene processes.

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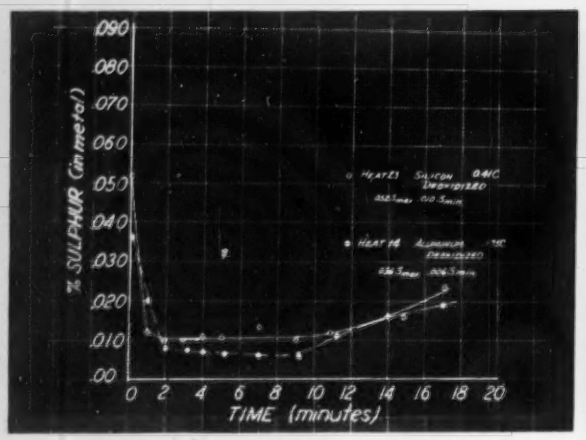
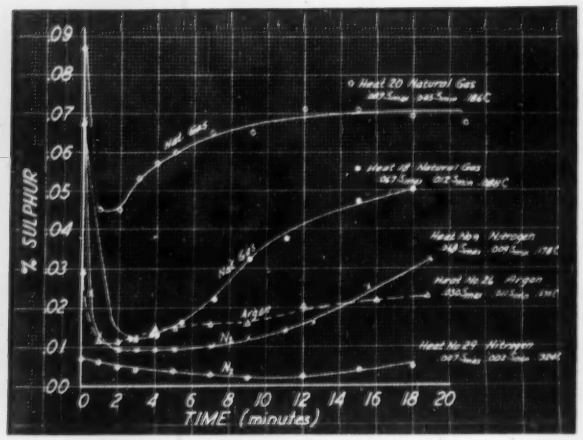


Heats made under air atmosphere show slow reversion



Typical heats made in four different gas atmospheres

bon and sulphur content, then given varying amounts of rare earth additions, then sampled at regular intervals during controlled holding time for sulphur determinations.

In this study, 33 heats were made in the 50-pound Ajax induction furnace with a magnesia crucible lining. Several types of iron charged materials were available, namely electrolytic iron, low-sulphur pig iron and low carbon steel scrap "boiler punchings" which were used as the base melting stock of the majority of heats.

Sulphur Controls — When some of the high sulphur heats required additional sulphur, beyond that amount in the charge, the addition was made by using ferrous sulphide. When it was necessary to produce heats having very low sulphur content, varying proportions of electrolytic iron and scrap were charged. The range of initial sulphur contents of the metal bath covered in this study varied between 0.007 to 0.100 per cent sulphur.

During the initial stage of the investigation the carbon content was held at a low level (around 0.05 to 0.15 per cent carbon) so that effects of the rare earth-carbon reactions could be minimized. Some of the later heats had carbon contents of about 0.50 per cent or greater. The high carbon content heats had a decided advantage during the melting stage for they produced a less violent boil than the very low carbon heats.

Atmosphere Controlled — Preliminary desulphurization results indicated that it would be helpful if the furnace atmosphere above the molten metal bath could be controlled or held at discretion of the operator. Consequently many of the heats were made utilizing a cover or lid that was placed on the furnace and sealed with moist air drying sillmanite. When inert gases or natural gas was used as protective atmosphere, the gas was fed into the furnace through one of the holes in the cover.

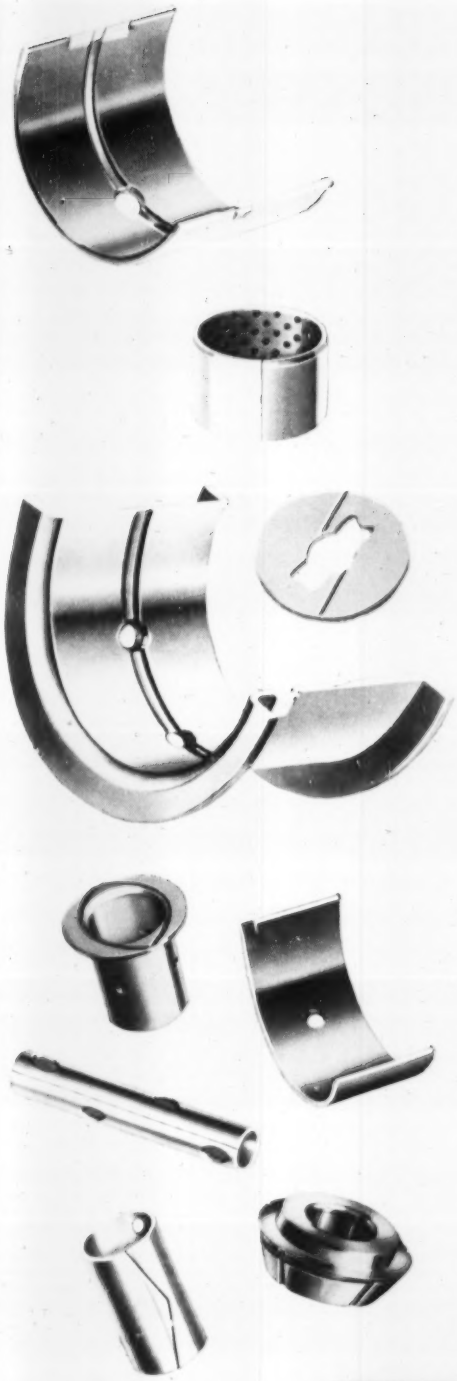
A so-called "reducing atmosphere" was produced by using a stream of natural gas, whose pressure was merely adjusted so that the flame burning from the cover outlet hole varied between one and two inches in length.

During the controlled furnace

(Please turn to page 117)

Table lists results of a number of air controlled atmosphere heats

Heat No.	Max	Min	Per Cent S Drop	Temperature °C	Atmosphere	Deoxidant	# L-Metal/Ton	Per Cent C
33	0.032	0.003	91	1545	Air	Si	8 L	0.505
32	0.038	0.004	89	1575	Air	Al	8 L	0.505
11	0.063	0.007	89	1565	Air	Al	8 L	0.065
10	0.047	0.005	88	1615	Air	Al	8 L	0.093
27	0.068	0.011	84	1550	Air	Al	8 L	0.495
83	0.036	0.006	83	1680	Air	Al	8 L	0.175
81	0.052	0.010	81	1580	Air	Si	8 L	0.410
30	0.040	0.002	95	1605	Nitrogen	Si	16 L	0.590
9	0.068	0.009	87	1595	Nitrogen	Al	8 L	0.178
13	0.041	0.006	85	1620	Nitrogen	Al	8 L	0.180
18	0.067	0.012	82	1665	Nat. Gas	Al	8 L	0.088
26	0.030	0.012	60	1670	Argon	Si	8 L	0.575
15	0.046	0.023	50	1615	Argon	Al	4 L	0.142
20	0.087	0.045	48	1610	Nat. Gas	Si	8 L	0.186
22	0.069	0.039	44	1625	Nat. Gas	Si	8 L	0.870
29	0.067	0.003	43	1655	Nitrogen	Si	8 L	0.324



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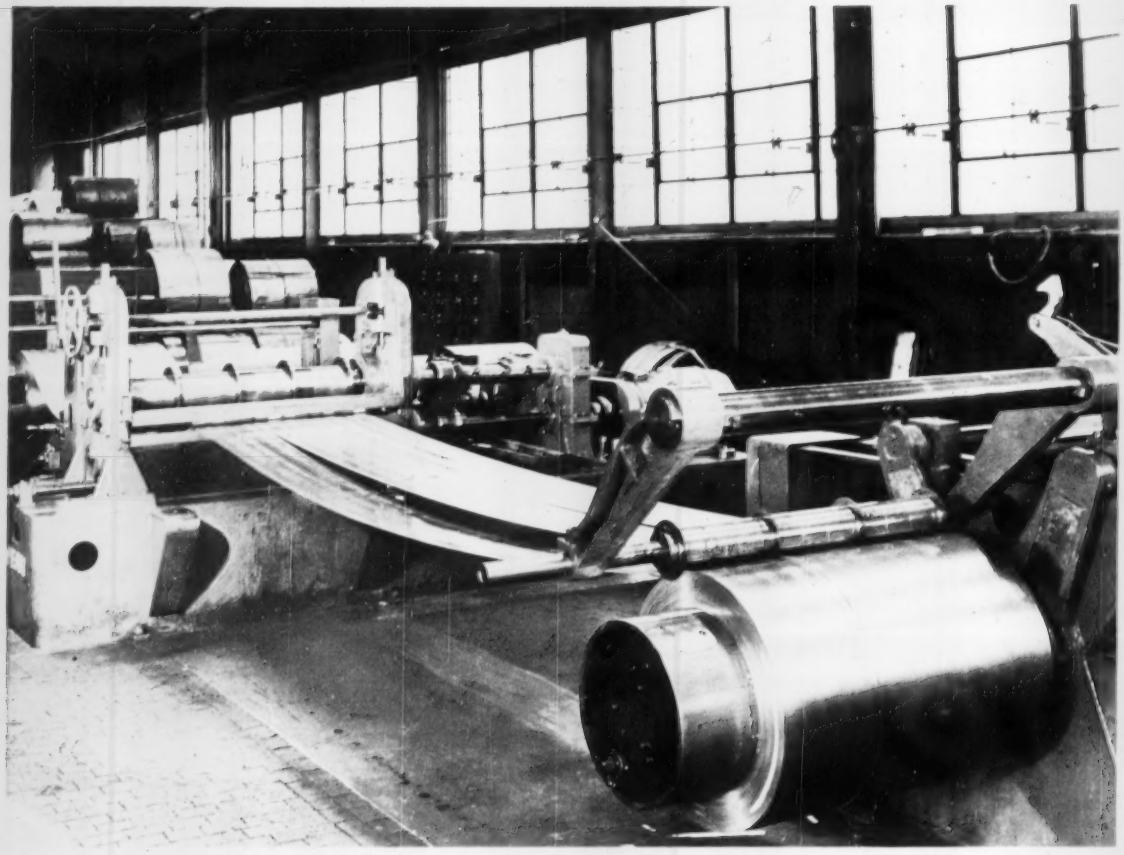
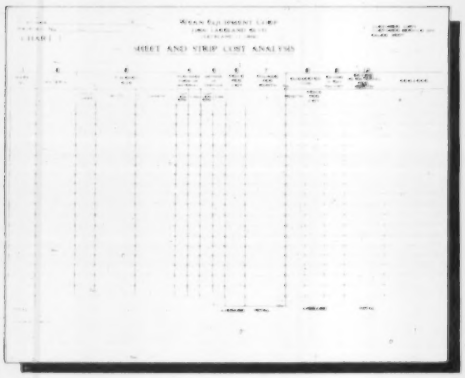


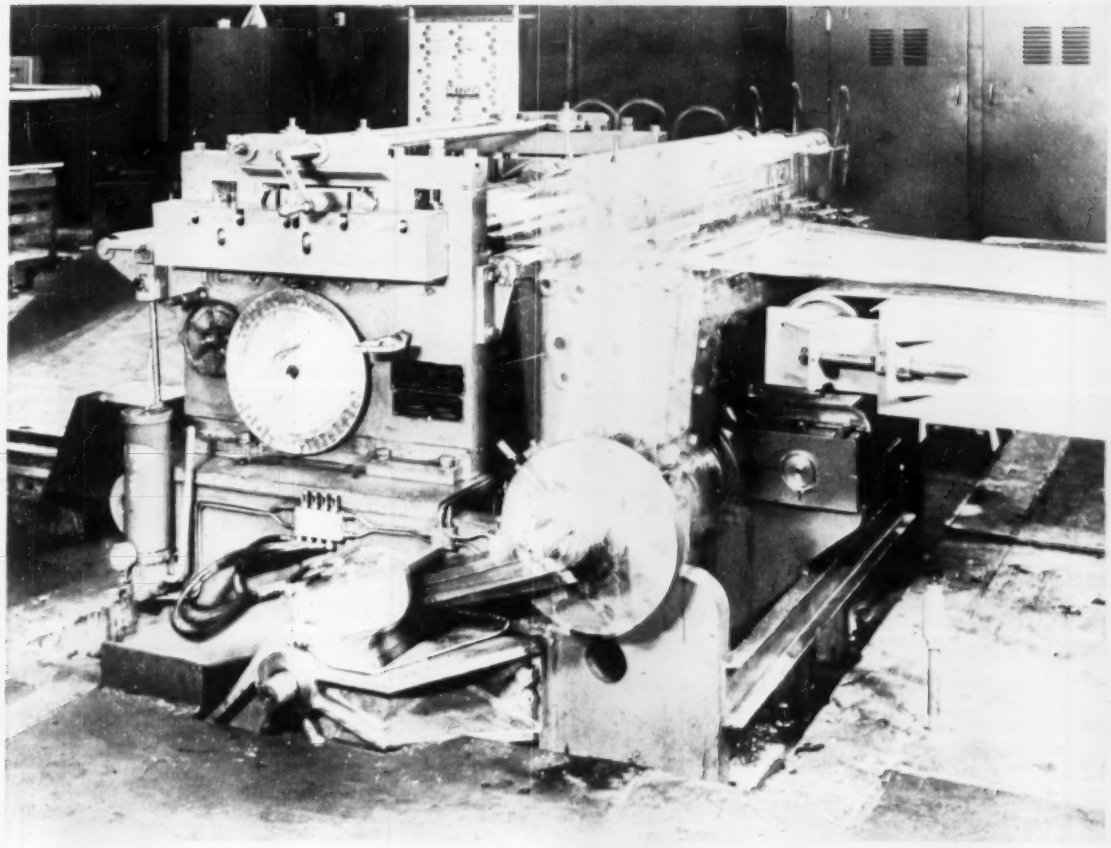
HERE'S HOW The WEAN Can Save You 20%

And

Here's A Simple Test That May Startle You

Want to save 20 percent on your steel costs? If you are using sheet steel in any great amounts a Wean Equipment engineer can quickly show you how the amazing new Wean Slitting and Flying Shear Line can effect this savings in your plant. Using your actual figures, Wean can, by a simple comparison method, quickly prove to you that these savings are possible. Why continue operating at high costs when this improved method could be saving you as much as $20 a ton on your steel?





Slitting and Flying Shear Line On Your Steel Costs

The secret of these tremendous savings is a short cut in getting steel from coil form to fabrication. If you are not one of those already using the Wean Slitting and Flying Shear Line you are either paying mill extras for shearing to tolerance and size or are forced to do this operation expensively and slowly in your own plant or a costly combination of both.

The Wean Slitting and Flying Shear System eliminates this entire processing function by converting steel from coil to production size, at resquared tolerances, at a rate of 100 cuts per minute.

Just figure it out for yourself. Apply these figures to your own operation. Total up the extras you are now paying for steel preparation and you'll see why it will pay you to talk with Wean.

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atmosphere tests, samples had to be obtained by the bulb-squeeze method in which a length of silica tubing is inserted into the metal bath and the sample drawn by means of an aspirator bulb. For heats made under an oxidizing or air atmosphere, samples were obtained by dipping plumber ladle spoons (low carbon steels two or three inches in diameter) into the metal bath.

Test Results—Majority of heats were made utilizing an oxidizing or air atmosphere over the bath of molten metal. In fact, 18 heats were made under this program, some of which were deoxidized with aluminum or ferrous silicon, and 2 heats were studied without any deoxidation, prior to the rare earth metal addition.

Two heats were made using an 80 per cent lanthanum alloy, while the other 16 heats utilized an "L-metal" addition containing 50 per cent cerium, 30 per cent lanthanum, and the balance rare earth alloy. In all heats, a marked decrease in sulphur content or sulphur drop was found to occur following rare earth metal addition.

Sulphur Drop — For the heats made under an oxidizing atmosphere, one group of curves shows that the sulphur was eliminated very quickly, usually within one to two minutes. The minimum sulphur point lasted for a very short time followed by a steady sulphur reversion.

Repeating, this first group of heats made under an air atmosphere may be characterized by a rapid decrease in sulphur content, generally occurring within the first two minutes after the rare earth addition; this was then followed by an appreciable sulphur pickup that approached the original sulphur content of the bath before the rare earth addition.

Best Result—Heat No. 30 (p. 112) made under a nitrogen atmosphere, illustrates the use of 16 pounds of L-metal per ton of steel which had been previously deoxidized with silicon. An original sulphur content of 0.040 showed a 95 per cent sulphur drop when a minimum of 0.002 per cent sulphur was obtained. This heat made at a relatively low temperature represents the best sulphur elimination obtained in all the heats studied. •

"Sulphur drops" varied between 25 and 78 per cent for heats made under air atmospheres. For these heats (19, 25, 5, 2, 24, 8, 7, 17, 3, 4, and 31) the effectiveness of the desulphurization of the steel by rare earth metal did not produce a positive correlation with steel carbon content. Carbon contents of the steel heats in this group vary from a minimum of 0.082 carbon to a maximum of 0.595 per cent carbon, as in Heat No. 31.

Heats made under air and controlled atmospheres show a rapid desulphurization followed by a relatively low sulphur level before reversion begins. Some of the best desulphurization results and reversion prevention or minimization were obtained in heats held at relatively low temperatures.

From a paper prepared by J. Alfred Berger, Dept. Head, Metallurgical Engineering, University of Pittsburgh, and Matts G. Snellman, formerly a research fellow at Molybdenum Corp. of America, now at Imatra Steel works, Finland. Paper was presented by Mr. Berger at the February meeting AIME, New York.

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Pouring beryllium copper master alloy from arc furnace at Brush Beryllium Co.

Beryllium Spikes Alloys For Tough Jobs

Versatile beryllium alloys still have the upper hand commercially although a great deal of work is going on to develop the pure metal for industrial and atomic uses

"THE ONLY light metal with a high-melting point," were the words used by C. B. Sawyer, board chairman, Brush Beryllium Corp., as he opened the Beryllium Conference a feature of the midwinter meeting of the American Society for Metals at Boston.

Beryllium melts at 2345 F, which is higher than copper and almost twice that of aluminum or magnesium. The metal is almost as light as magnesium and keeps its polish better than aluminum, and it has a modulus of elasticity above 40 million psi, compared with about 30 million for steel.

Even so, uses for pure beryllium are scarce. The metal is making a name for itself as an alloying element, where a little goes a long way. Known for its potent precipitation hardening ability, the heat treatable beryllium-copper is the hardest and strongest copper base alloy known commercially, producers say.

Basis For Hope — Favorable strength-weight ratio of beryllium over other light metals (including zirconium and titanium) and its ready availability today in substantial tonnage promise increased use of the pure metal in special devices. Its lightness, exceptionally high modulus and good machinability are pay-off factors.

By far the largest use in pure form is in the nuclear energy field. Beryllium has an extremely low neutron absorption cross section about 1/20 that of zirconium, often thought of as the atomic favorite. Coupled with this is its ability to moderate or slow down the ve-

PROPERTIES OF WROUGHT BERYLLIUM-COPPER ALLOYS

Alloy	Condition and Temper	Tensile Strength psi	Yield Strength 0.2% Offset	Proportional Limit 0.002% Offset psi	Elongation % in 2 in.	Fatigue Limit 100 Million Cycles psi	Rockwell Hardness B or C Scale	Elec. Cond. % IACS
2% Be	Heat Treated from Hard	185-210,000	160-185,000	95-130,000	1-2	40-46,000	C40-44	22-30
2% Be	Hard	95-120,000	95-112,000	70- 85,000	2-4	33-38,000	B94-99	15-17
2% Be	Heat Treated from Sol.-Annealed	165-180,000	130-150,000	70- 80,000	5-8	35-40,000	C36-40	22-30
2% Be	Annealed	60- 80,000	28- 36,000	15- 20,000	35-50	25-30,000	B45-65	17-19
1.2% Be	Mill Hardened	125-140,000	105-125,000	60- 65,000	12-20	30-35,000	C23-30	22-26
1.2% Be	Heat Treatable	55- 65,000	18- 30,000	15- 20,000	40-60	25-30,000	B65 Max.	18-22
0.5% Be	Heat Treated from Hard	105-130,000	100-120,000	60- 80,000	5-10	30-35,000	B92-100	18-60

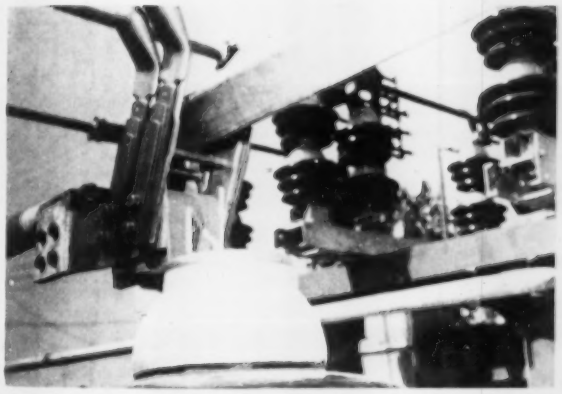
Based on data given by N. W. Rose, Brush Beryllium Co., at ASM Midwinter Meeting, Boston.

BERYLLIUM-COPPER ALLOY PROPERTIES

1. Good formability before heat treatment
2. A-1 machinability when annealed or semi-hard
3. Simple heat treatment increases physicals
4. High electrical and thermal conductivity
5. Unusual resistance to fatigue and impact
6. Corrosion resistance comparable with copper
7. High stability under load
8. Castability good
9. Stable at elevated temperatures
10. Nonmagnetic and antisparking
11. Wide range of properties possible through change in beryllium content or heat treatment procedure

WHO MAKES THEM

Beryllium Corp., Reading, Pa. and Brush Beryllium Co., Cleveland, are the two large primary producers of beryllium products. Also, Clifton Products Inc., Painesville, O., on a smaller scale. Other companies who fabricate beryllium-copper alloys into wrought or cast form: Riverside Metal Co., Riverside, N. J.; Ampco Metal, Inc., Milwaukee; Wilbur B. Driver Co., Newark, N. J.; and P. R. Mallory & Co., Indianapolis. Slagle Beryllium Co., Upper Darby, Pa., Penn Precision Products Inc., Reading, Pa., General Plate Division, Attleboro, Mass.; and American Silver Co., New York, have reroll mills for thin strip. Little Falls Alloys Inc., Paterson, N. J., produces fine wire.



Beryllium Corp.'s mill hardened "Beryldur" in switchgear application

locity of neutrons produced in fission. Metal is also important as x-ray discs or "windows" because of its high permeability to x-rays.

Powder metallurgical techniques are used in fabricating the pure metal. N. W. Bass, vice president, Brush Beryllium Co., says his company produces blocks up to 5 feet by 2 feet by 6 inches or rounds up to 28 inches in diameter. Forms may be readily machined to final shape or used in extrusion or rolling billets.

Alloys First — Precipitating hardening copper or nickel alloys dissolve beryllium in solid solution over a range from about 0.1 to 3.0 per cent. More beryllium is dissolved at high temperatures (still below the melting point) than at room temperature.

Significance: When alloy is heated into the range of higher solubility for beryllium and cooled quickly, the metal is retained in supersaturated solution (alpha phase); alloy is soft and workable at room temperature. However, upon reheating to a relatively low temperature (below red heat), the supersaturated solution precipitates out submicroscopic particles of beryllium compounds (gamma phase), which are scattered through the grains of the metal and harden it.

The reheating process may be varied in practice so that the degree of precipitation hardening is varied to give a wide range of properties from the softest state with high formability to the hardest with high strength.

Types — Beryllium-copper alloys are classified as high strength, or high conductivity materials. High strength alloys contain over 1.5 per cent beryllium; they offer maximum strength and hardness. High conductivity alloys, under 0.75 per cent beryllium, are preferred where electrical or thermal conductivity is more essential than maximum strength or hardness.

A new beryllium-copper containing about 1.2 per cent beryllium has been developed by Beryllium Corp., Reading, Pa. Known as "Beryldur" it has properties between the high strength and high conductivity alloys. Because of its lower beryllium content, it is cheaper than the 2 per cent alloy.

Standard — Best known beryllium-copper alloy contains 1.8 to 2.05 per cent beryllium, and about 0.35 per cent nickel or cobalt as a grain refiner and heat treatment stabilizer. (Properties of several beryllium alloys are shown in table.)

The standard 2 per cent alloy combines good electrical conductivity and highest hardness and strength of any copper alloy. It has good fatigue resistance, stands up to corrosion and wear, is easy to form and is nonmagnetic.

It is widely used for springs, pressure responsive bellows, diaphragms and bourdon tubes, electrical contacts, aircraft engine parts, cams, bearings, resistance welding electrodes (RWMA Class 4), flash-welding dies, plastic molds, marine propellers, pump parts, gears, valve parts, bearing retainer rings, cowl flap hinges, spring shims and washers, precision castings, rollers and gun mount parts. Low sparking characteristics are important for safety tools.

Conducts Better—High electrical and high conductivity beryllium-copper alloys contain 0.25 to 0.70 per cent beryllium, and from 1.5 to 2.5 per cent cobalt or nickel as the grain refiner and stabilizer. They have about one-half the strength and hardness of the 2 per cent alloy; but, electrical conductivity is about $2\frac{1}{2}$ times higher. Another advantage: Better elevated temperature properties.

Applications include: Resistance welding electrodes (RWMA Class 3), spot, seam, flash and projection welding dies and electrodes, switches and switchgears, circuit breakers, electrode holders, marine diesel brake and clutch drums, pinions, sliding contacts, electrical

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control heads, current carrying terminals and similar uses where strength, conductivity and resistance to wear, and moderately elevated temperatures are required.

Nickel — Heat-treatable, beryllium-nickel alloys have good strength and hardness; but amount used is still small. Alloy is precipitation hardened around the 930 to 950 F range. They resemble stainless steels in density and corrosion properties; in strength, hardness and elastic modulus, they compare with high strength alloy steels.

Beryllium Steels—A 1-per-cent beryllium-iron alloy with 6 per cent nickel can be hardened by quenching and aging to around 600 Brinell. Beryllium steels, containing 1 per cent beryllium, 12 chromium, and 11 nickel, have high strength and hardness at elevated temperatures. A German report cites spring properties at red heat.

Others: Beryllium Elinvar (1 Be, 38 Ni, Bal. Fe), used as spiral springs for watches, has a ratio of expansion to temperature that is practically nil. Beryllium Contracid (0.6 Be, 60 Ni, 15 Cr, 7 Mo, Bal. Fe) is used abroad in surgical instruments, corrosion resisting springs and similar applications involving high strength coupled with good corrosion resistance. Elgiloy (Be, Ni, Cr, Mo, Co, Mn, Fe) is used for springs, snap switch components, ball bearings, valves, etc. V2B is a heat treatable stainless steel developed by Cooper Alloy Foundry Co. containing 0.1 to 0.2 per cent beryllium.

Brass Sub—General Electric Research Laboratories are looking at a new alloy called ZnCuBe, containing 0.1 Be, 2 to 2.5 Cu, balance zinc. It is said to be equal or superior to cold rolled 70-30 brass in physical properties. A cost advantage is also claimed, plus good corrosion resistance. It may find use in lamp and fuse hardware.

Beryllium in aluminum alloys (0.1 to 0.5 per cent) contributes to ease of casting, adds to thermal stability and refines grain. Only 0.005 per cent beryllium added to magnesium or aluminum alloys containing magnesium reduces flammability appreciably and lessens oxidation at melting point.

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The J. E. Baker Company can't solve your sleeping problems, but they can show you how to increase your quantity of more uniform ingots, with less defective production material, and at lower fuel costs . . . if you use BAKER'S MAGDOLITE, the original dead-burned dolomite. It has chemical, physical and mineralogical qualities that assure a better job. BAKER'S MAGDOLITE is always 5 ways better: Composition. Preparation. Strength. Economy. Quality.

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Plants: Billmeyer, York, Pennsylvania — Millersville, Ohio

General view of the rack storage area set up for operation at Pratt & Whitney, with all books in place in their racks

Library System Catalogs Sheet Stock

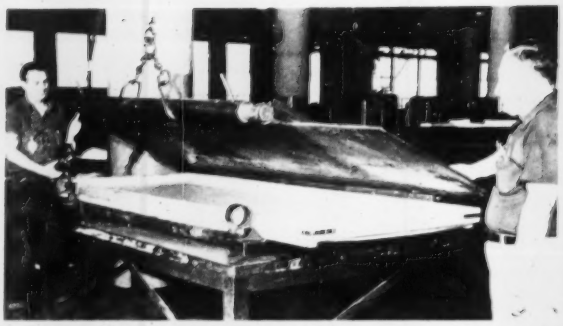
Pratt & Whitney Aircraft reclaimed 50 per cent of the space it used for sheet storage, reduced delivery lead time with its new indexing technique

WHAT amounts to a library of welded steel and plywood books functions to simplify storage and handling of the hundreds of alloy sheet metal types required in aircraft engine manufacture. The system is operated by Pratt & Whitney Aircraft, division of United Aircraft Corp., to serve its East Hartford and Southington, Conn., plants.

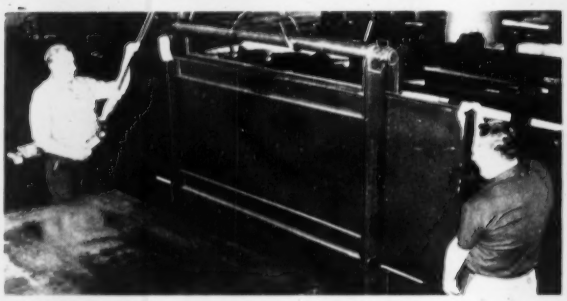
The storage system is designed for in-plant as well as warehouse storage, is made by Acme Welding, division of United Tool & Die Co., West Hartford, Conn. At the source, Pratt & Whitney concentrates the large quantity of sheet metal necessarily carried in stock. A large building in Hartford is leased for this purpose and houses 1116 books of sheet stock. All receiving, inspection and some shearing take place here.

Branch Libraries—From this hub, books of requisitioned metal move out to so-called branch libraries by truck. In East Hartford plant alone seven such centers located at key production points require a total of 170 books.

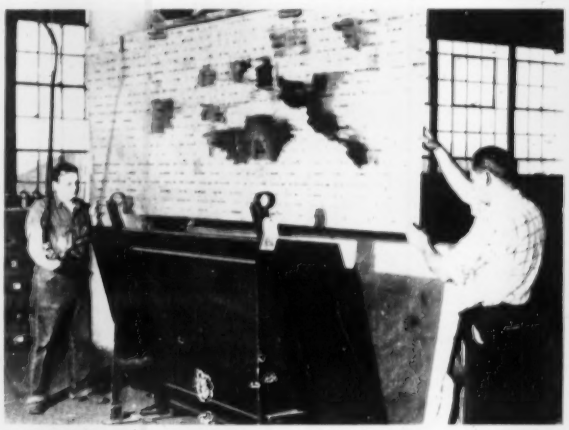
When books are empty they are returned to the receiving point for re-use. As a result, the company says there is never a delay on the production line due to lack of the right sheet stock when it is needed. This has definite advantages over the handling situation faced by the division before the current system



Transfer rack is on transfer table as a pack or book side is positioned and attached to bottom support for closure



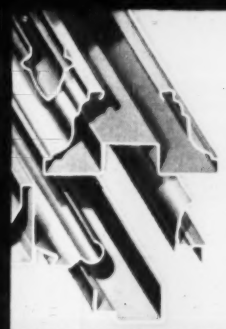
After crate is removed and second side of pack attached, book is closed and locked, then placed in storage rack



When orders are received for sheet, proper book is removed from rack, placed in V rack and identified sheet extracted

Open book can be placed directly in front of a shear and sheets removed directly from book to the shearing machine

Van Huffel cold formed metal shapes and tubing simplify design and cut production costs for the makers of



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No matter what you make that farmers use, chances are Van Huffel Cold Formed Metal Shapes and Tubing can help you make it faster, cheaper and better.

Faster because cold formed parts require very little or no machining; parts come to you shaped, cut, punched, or bent to your specifications.

Cheaper because of the high strength-to-weight ratio you can, in many cases, use lighter gauges, or smaller sizes in place of solid metals. Parts are uniform in thickness, free from scale, and ready to paint.

Better because of the wider latitude in choice of materials, design possibilities and fabrication methods. Shapes and tubing can be produced in Cold Rolled, Hot Rolled and High Tensile Steels. Van Huffel cold forms strip metals 1/2" to 33" wide; regular and irregular shapes in .018 to .312 gauge; tubing from 3/16" to 6" in diameter in any lengths.

As competition brings demands for simplifying parts and lowering costs, we invite you to consult us on the possibility of doing the job better and more economically with Van Huffel metal shapes and tubing.

Van Huffel

TUBE CORPORATION · WARREN, OHIO

Where ideas take shape for makers of farm equipment

RELAX

The House of Stainless

CHICAGO STEEL SERVICE CO.

Kildare Avenue at 45th Street, Chicago 32, Ill.
Telephone: LAfayette 3-7210

Sales Representatives at Bloomington, Moline and Rockford, Illinois; Indianapolis and South Bend, Indiana; Cedar Rapids, Iowa; Grand Rapids, Michigan; Fond du Lac, Wisconsin

was installed. Then sheets were stored in rows of flat crates that used up production floor space. They were subject to warping and sagging and were scraped and bent when crates were broken in handling. Usually the type of sheet required was at the bottom of the pile.

Demand and Supply—All work is done now by overhead crane. When a crate of sheet is received, it is placed on a welded steel transfer, top of the crate is removed and a steel channel hinge, welded steel and plywood cover are connected on top. Then the crate is turned over by a specially-designed hoist bar. Transfer rack and the other side of the crate are removed and replaced by the second book cover. Completed book is swung into its proper position in the vertical steel racks for immediate availability.

If sheet stock is needed at a distant point within the plant, the system includes a mobile V-rack for easy transportation.

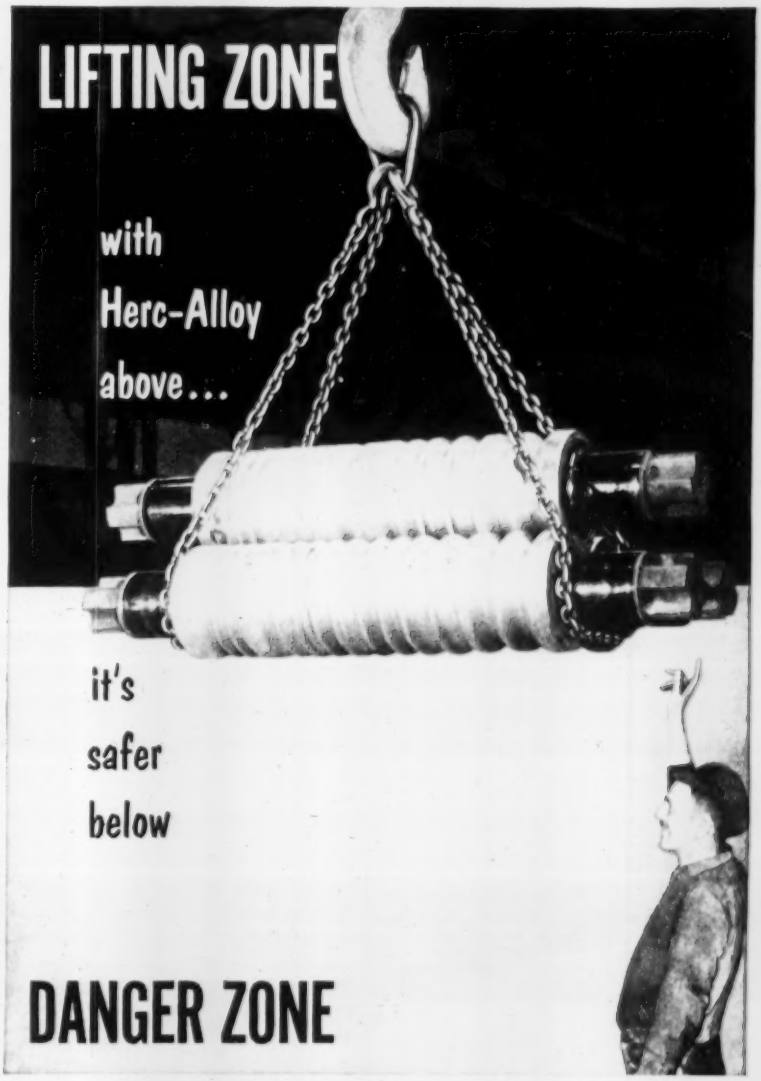
The system's savings are impressive: P & W says it cuts in half the floor space required for flat storage and accounts for a 90 per cent reduction in handling time through elimination of manual effort. Delivery time is down from 60 days to 1 day on stock and all the stock gets complete protection during storage and handling.

Specs for Metallic Coatings

A publication designed to bring together in convenient form, for the use of industry, all of the ASTM specifications and methods of test pertaining to electrodeposited metallic coatings on metals is available.

ASTM Committee B-8 on Electrodeposited Metallic Coatings and the American Electroplaters' Society prepared jointly the specifications and tests in this latest edition.

Subject headings in the book are: Specifications for electrodeposited coatings; method of testing; recommended practices for treating some specific metals. Copies may be had by writing American Society for Testing Materials, 1916 Race St., Philadelphia 3. Price is $1.85.



SPECIFY
HERC-ALLOY
SLING CHAINS

Write for Data Book

HERC-ALLOY
Sling Chains are registered by individual serial number and can be rebuilt or replaced at any time to original specifications.

The Allegheny Ludlum Steel Corp., pictured above, uses Herc-Alloy Sling Chains for hundreds of tough lifting jobs in its plants. In addition to maximum safety, Allegheny Ludlum also enjoys the extra economy of longer-lasting Herc-Alloy. These sling chains offer still another advantage...a weight reduction unmatched by any other alloy chain without any sacrifice in tensile strength. This reduces worker fatigue. All things considered, don't you think Herc-Alloy Sling Chains are worth a try in your plant.

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Tungsten Carbide Tooling

ROUGH TURNING time for 5-½ x 18-½-inch-long SAE 4340 steel housing assemblies (Brinell 300) was recently reduced from 45 to 18 minutes by switching from high-speed steel tools to standard tungsten carbide tooling.

The operation was performed on a 50-hp Fay Automatic at the Carnes & Mitchell Machine Works, Los Angeles. It consists of reducing the assembly's diameter to 3-¾ inches and leaving a 30-degree profile in the center and a 5-½-inch diameter flange on each end of the workpiece. Metal removal per piece amounts to approximately 53-½ pounds.

Three tools in the back slide plunge-cut the relief grooves and face the flange. Two tools in the front slide rough-turn workpiece's diameter and center profile.

Faster Feed, Speeds—According to Kennametal, the operation is now handled at 3.8 times the previous speeds and double the previous feeds utilized with three standard Kennametal grade K2S brazed tools in the back slides, two of style C-86 and one of style C-66, and two standard square insert Kennamatics of style SBR-86A in the front slide. Speed is now 230 revolutions per minute and 331 sfm. Feed is 0.024 inch for the front slide and 0.018 inch for the back slide. Although three cuts at 0.300 to 0.350-inch depth are required, machining time has been reduced by 60 per cent.

Brazed carbide tools machine ten pieces per grind, and the square-insert carbide tools turn 80 pieces per grind.

"Switching to NILSON 4 SLIDES Saved us $17,656 on metal alone"
Yes, simply by changing stamping methods, this NILSON Customer profited 4 ways:
1. Production increased 80%.
2. 72% less metal used (per 4 million pieces).
3. Greatly improved quality with minimum of rejects.
4. Strengthened competitive position with greater profit margin.
You, too, can enjoy these advantages in producing your own wire forms and small metal stampings. Parts such as illustrated in the margin were straightened, fed, pierced, blanked, swaged, stamped or coined, cut-off and formed AUTOMATICALLY in NILSON 4 SLIDES in one quick precise operation. ONE Machine, ONE Operator.
NILSON 4 SLIDES available in wide range of sizes: forming Wire up to ½" diam. in feeds to 32" max. and Metal Ribbon stock up to 3½" wide. Press sections 5 to 30 ton capacity. Heavy Duty Types in 50 and 75 ton models.
MODEL S4E Nilson 4 Slide with No. 5H Nilson Editing Stock Reel.
THERE'S NOTHING LIKE A NILSON
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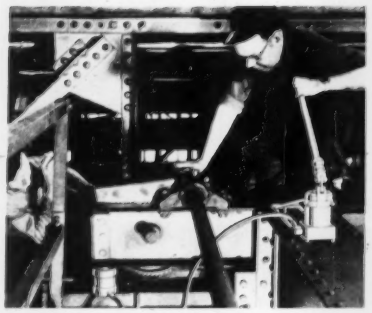
1512 Railroad Avenue • Bridgeport 5, Connecticut
Automatic Chain Making Machines • Automatic Staple Forming Machines • Wire and Stock Reels • Foot Presses • Wire Straightening Equipment • Slide Feeds for Presses



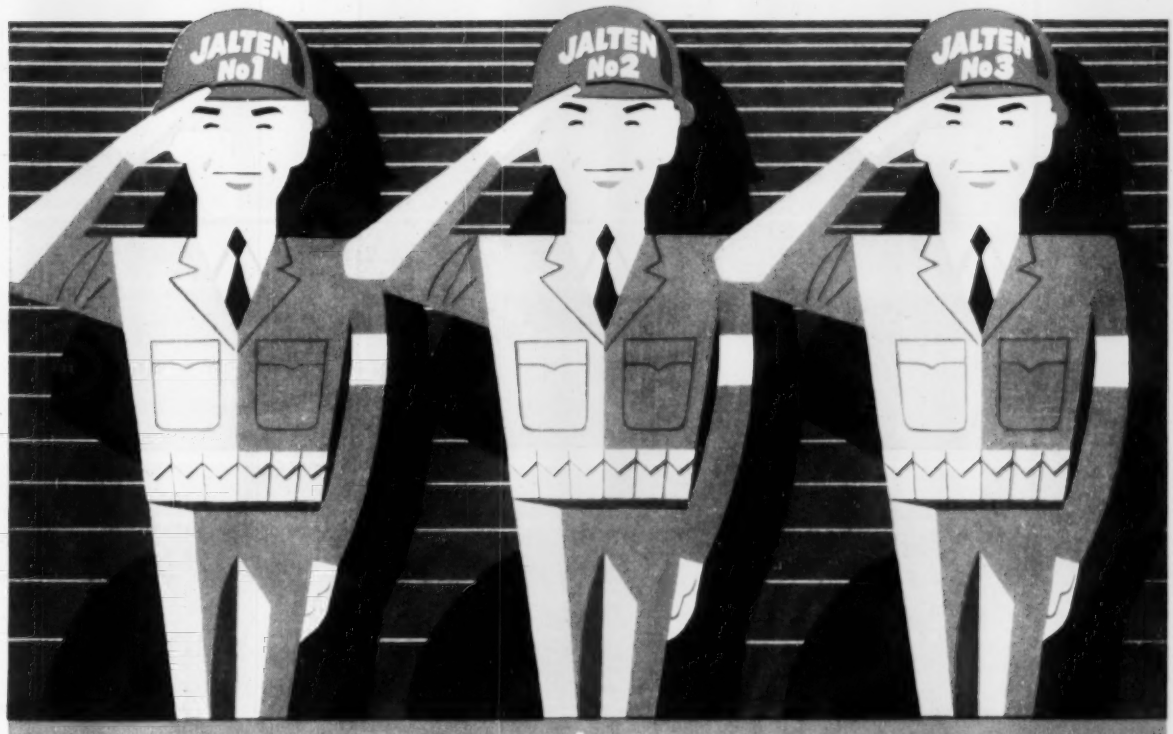
Close Quarter Lifts

Jacks that weigh 38 pounds and raise as much as 30 tons are making repair jobs on overhead cranes easier. Called the Lo-Hite jack by Duff-Norton Mfg. Co., it is hydraulically-operated, lightweight, portable, safe, and its ram can be used with ease 8 feet from its pump

Why Do Contacts Fail?

A tiny platinum wire is helping to solve the mystery of why certain metal surfaces on wires and contacts fail at times to conduct electricity; even though they are physically joined. The wire, one-thirtieth as thick as a human hair, is formed into a loop, can be used to detect finger prints and other films built up by oxidation or tarnishing. Even invisible films can frequently be detected.

When compressed against a surface, the resilient platinum probe developed by General Electric Research Laboratory scientists, ferrets out films on the most highly buffed and machined surfaces. Measurement of the pressure exerted with a micrometer suggests film type and electrical strength.



Give your order...

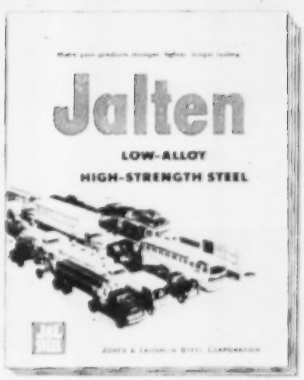
THEY'RE ALL JALTEN!

J&L's New JALTEN series enables you to select low-alloy, high-strength steel in the following combinations of advantages:

JALTEN No. 1 — High strength, good formability and fabricating — good resistance to low temperature impact.

JALTEN No. 2 — High strength, moderate forming — improved resistance to atmospheric corrosion.

JALTEN No. 3 — High strength — improved resistance to abrasion.



The data you want is in this book:

- Chemical Properties of Jalten
- Mechanical Properties of Jalten
- Jalten Equivalents
- Jalten Application Data

Remember to specify JALTEN High Tensile Steel for

- HIGH STRENGTH • RESISTANCE TO CORROSION
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Please forward a copy of your booklet, Jalten low-alloy, high-strength steel.

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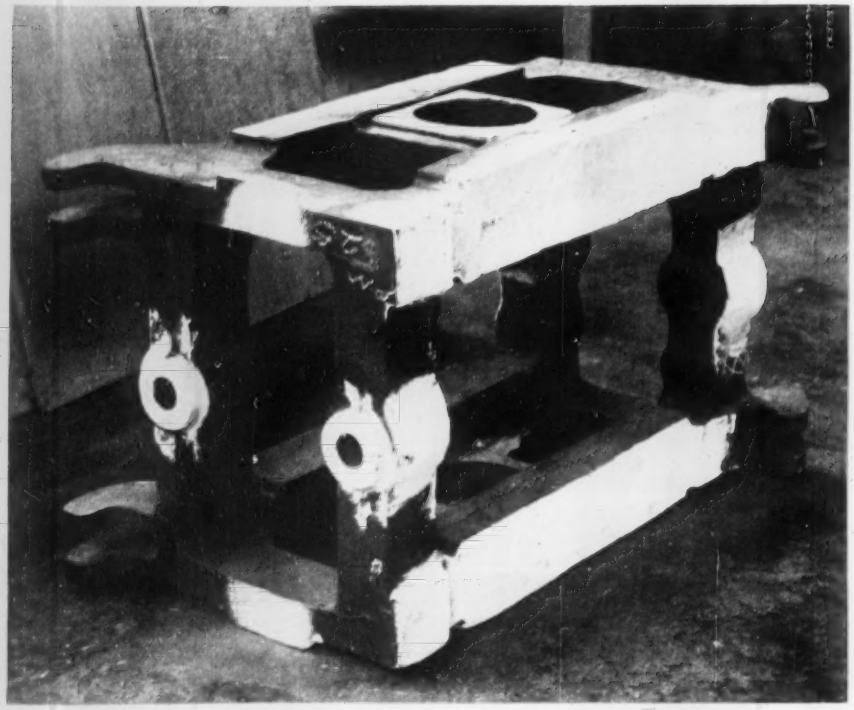


This 2000-pound frame casting was made originally with a ¼-inch per foot shrink rule. It did not shrink at all because the design necessitated a pattern of nearly all cores, and it was impossible to machine and hold dimensions. It was necessary for the foundry to make a new pattern in order to make a satisfactory casting. They have had similar experiences

HOW TO ALLOW FOR

Shrinkage in Castings

Customers should give the foundry right to specify shrinkage and finish allowances because shrinkage often differs in various foundries. Here's the explanation

IN purchasing and preparation of specifications for medium and large steel castings, the foundry should be permitted to make the pattern with allowances for proper shrinkage or be given the right to specify the shrinkage and finish allowances.

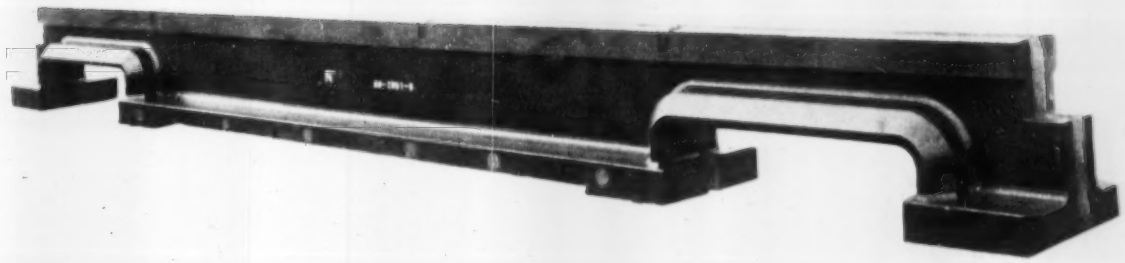
Reason for this, says Hubert Chappie, foundry superintendent, National Supply Co., Torrance, Calif., is that the shrinkage in one foundry often differs from that in another. Several different shrinkages may even occur in one casting, depending upon its design and the materials used in molding and coring.

Here's Why — A better understanding of the several factors that enter into shrinkage of medium and large steel castings will show why there is no hard and fast rule for specifying the shrinkage, as there is for the average small casting. Shrinkage may vary from nothing to 5/16 inch in castings having as much as five tons of metal. Every foundry must establish its own table for pattern shrinkage based on casting design and the method of making molds.

Records have been kept for every steel casting made at the National Supply foundry during the past three years in order to provide a more complete understanding of shrinkage problems. This experience has been influenced by the reported experience of others, including the effect of carbon content of the steel, increase of which decreases "free" contraction.

Main Cause—"Hindered contraction" was named as the main cause of variations in contraction. Hindered contraction is caused mainly by design and the materials and methods used in molding and coring. Changes can often be made to meet user requirements.

There are many known instances of castings in which design has restricted shrinkage and caused hot tears. It may be impossible to avoid hot tearing without a change of design. It may even be neces-



Patterns for right and left hand slide rails, 16 feet long, were made with a ¼-inch shrink rule. The customer paid the cost of removing two inches from each to conform to a ⅛-inch rule. Castings shrunk to size

sary to make two castings and weld them together.

It is better in many instances where two castings have been welded together, to weld a crack in the part cast in one piece. The cost is invariably increased by making two castings. However, linear shrinkage can then be held to the closest tolerance because of spacing accurately before welding, and there will be less hot tearing.

Sand Troubles — Hindered contraction may be caused by the sand, pockets in the cope requiring excessive gaggering, and bars in the flasks, ramming, or the utilization of several heads. Sand ingredients are the principal causes. The amount of silica flour affects mold or core restrictions considerably because of expansion. If the hot strength of the sands exceeds 25 psi at 2500° F, the possibility of hot tearing of the casting increases.

Although expansion can be counteracted by the addition of cellulose materials and Southern Bentonite, experience indicates that the casting surfaces are not free from penetration. It is much better to weld a crack than have sand in the surfaces which cause trouble in machining. Molds in green sand shrink much more than in dry sand. This is natural because it does not have the strength of dry sand to resist shrinkage.

Too Many Gaggers—It is obvious that steel gaggers and bars prevent the mold from contracting, thereby minimizing linear shrinkage. Gaggering is probably overdone because no one knows when a mold has been properly gaggered and because of the risk of under-gaggering and losing a casting. A molder would be humiliated by his fellow workers if a cope dropped because of too little gaggering. Consequently the best alternative is to loosen the bars and gaggers or remove them as soon as the metal solidifies. This permits more linear shrinkage and prevents hot tears.

Ramming has an obvious effect on linear shrinkage. The harder the sand is rammed, the less the shrinkage. Also, the finer the sand, the less will be the contraction. This can be counteracted by creating pockets at a suitable distance from the metal surfaces. These pockets may be open or filled with such materials as charcoal, coke, sawdust, cinders, or loose sand, thus permitting the hard-rammed sand to move during shrinkage.

Use of Relievers Several heads on one casting would restrict a casting from having free shrinkage in relation to the hardness of the rammed sand between the heads. This also can be counteracted by means of relieving blocks, placed a few inches from risers in the direction of contraction. The blocks can be removed when the metal has solidified, leaving open spaces that do not resist contraction of the casting.

Relievers such as loose dirt or chains have also been used instead of wood blocks. The casting can also be removed from the mold before linear shrinkage starts, thus removing any stress that may be caused by hindered contraction.

Some Examples—Practice at National Supply, when quoting on large castings (10,000 pounds or more) is to get the customer's permission to make the pattern, or if this is done elsewhere, to specify how the pattern is to be made, the shrinkage, and the amount of finish. In some instances it has been necessary to alter patterns made with a ¼-inch shrink rule to ⅛-inch shrink rule.

In another instance a frame casting weighing approximately 2000 pounds was made with a ¼-inch shrink per foot from a pattern that was practically all cores. The casting did not shrink at all and it was impossible to machine and hold dimensions. An entirely new pattern, made to a no-shrink rule, was necessary. The casting was then entirely satisfactory. The foundry has had a number of similar experiences.

Customer vs. Foundry—If a customer's blue print does not call for finish, he is contacted for tolerances. If the required dimensions are too exacting, he is informed, and a record of an agreed tolerance is established.

If all factors preventing free contraction are recognized and remedies are used, or they are taken into consideration in determining pattern shrinkage, much misunderstanding between purchasers of steel castings and foundry engineers would be clarified.

From Mr. Chapp's paper before the technical and operating group of the Steel Founders Society of America

WHY IT PAYS TO BUY STEEL FROM WAREHOUSE

You don't need steel inventories as long as your arm!

WHEN YOU BUY STEEL FROM WAREHOUSE, YOU GET:

- LOWER INVENTORY COSTS
- LOWER SPACE COSTS
- LOWER TIME COSTS
- LOWER CAPITAL INVESTMENT
- FASTER PRODUCTION
- FEWER INVENTORY LOSSES

Big steel inventories not only take up space in your plant, but they tie up large sums of your working capital. U. S. Steel Supply can help you avoid both of these problems. We can deliver steel as you need it, avoiding production hold-ups, and keeping steel inventories down to a minimum. Your U. S. Steel Supply salesman will arrange the delivery of the steel you want, at the time and place you want it.

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UNITED STATES STEEL

NEW PRODUCTS and equipment

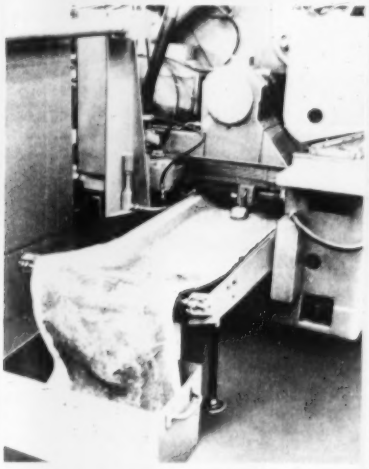
Reply card on page 143 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue

Coolant Filter

. . . designed into grinder

Norton engineers have incorporated into the base of their newest grinder the Delpark coolant filters. By designing the Delpark principle of filtration into their machines a high degree of efficiency has resulted.

The coolant filters apply a new principle in filtration of coolants. It is a continuous, self-cleaning gravity filter. Solids are filtered from liquids that will flow, by



gravity, through filter material. This discharges the solids, in relatively dry state, into an outside container. Filter material is fed on a conveyor-like basis. Industrial Filtration Co.

FOR MORE DATA CIRCLE NO. 1 ON REPLY CARD

Volt-Ammeter

. . . is shock-resistant

A hook-on volt-ammeter with automatic scale changing is announced by GE.

Designated the AK-5, the pocket-size unit is designed to measure current and voltage quickly and accurately. The automatic scale

changing feature eliminates the possibility of reading the wrong scale for application. It has a current range of 5/20/80/350 amperes. The instrument also measures ac voltage in three ranges without auxiliary equipment, provides accuracy up to 3 per cent of full scale and withstands a voltage breakdown test of 4000 volts ac. It will clamp around any conductor up to two inches in diameter. Its contoured trigger closes and opens the hook-on assembly, insulated to safeguard against grounding or short-circuiting. General Electric Co.

FOR MORE DATA CIRCLE NO. 2 ON REPLY CARD

Water Seal

. . . sticks in any application

An easy-to-apply soft plastic material has been designed for sealing pipe joints, screw threads, gasket joints and flanges on lines handling water, air, ammonia, gas and steam. It is also used on bolts and studs.

The manufacturer claims Vike Water Seal will not shrink, crumble, or crack and contains no corrosive substances. Joints sealed with the material can be broken easily and quickly when necessary. It is available in 1-pound and 7-pound cans, 25-pound pails, 100-pound kegs and 400-pound drums. Keystone Lubricating Co.

FOR MORE DATA CIRCLE NO. 3 ON REPLY CARD

Pipeline Regulator

. . . for low pressure areas

An 8900 series of regulators is designed for use with gases supplied by pipeline systems using comparatively low pressures.

They are said to afford greater flow capacities in most cases because of the improved regulation

and lower static increment. These oxygen and cutting regulators will accurately maintain a steady gas pressure eliminating the need for frequent regulator adjustment regardless of fluctuation in the line pressure. Of inverse design, they feature a novel seating arrangement requiring no nozzle. Air Reduction Sales Co.

FOR MORE DATA CIRCLE NO. 4 ON REPLY CARD

Limit Switch

. . . easily adjustable

A machine tool limit switch has been designed for easy adjustment of the basic device to obtain eleven different contact operating se-

quences using only a screwdriver.

A variety of operating lever arms is available which can be mounted in any angular position. Although only small travel is required to operate the switch, a

large amount of overtravel (about 80 degrees) is provided in either direction. Diecast enclosures are fully gasketed with neoprene, making them water tight, oil tight and dust tight. Seven types of baseplates, as well as threaded holes in the side of the diecast box, permit mounting in a variety of positions. Square D Co.

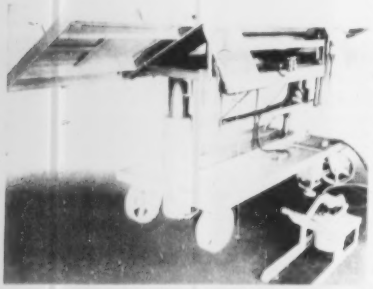
FOR MORE DATA CIRCLE NO. 5 ON REPLY CARD

Sheet Feeding Table

. . . has built-in safety guards

Designed for fast, accurate stock feeding into an inclinable bed press is a 3-ton capacity Rack hydraulic sheet feeding table. Its tilt top is hydraulically activated.

All welded steel construction



assures dependability. Operated by a two-speed foot pump, a two-way valve controls both the tilt and straight elevation of the table. Ten-inch heavy duty steel casters with roller bearing hubs provide easy movement with heavy loads. A floor lock brakes the table against movement. Drop sides allow fast handling of longer sheets and strips. Rack Hydraulic Equipment Corp.

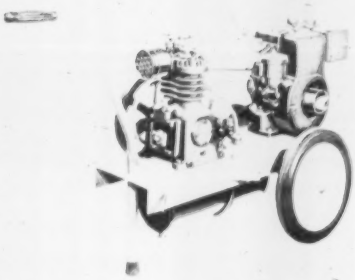
FOR MORE DATA CIRCLE NO. 6 ON REPLY CARD

Air Compressors

. . . with electric or gas power

A line of portable air compressors is now available in a variety of models.

Designed expressly for spray painting is a 1-hp model, rated at 60 pounds maximum pressure and delivering 5.4 cfm of air. For general utility work a $\frac{1}{2}$ and 1-hp compressor has been designed. Both have a 100-pound maximum pressure rating. The 1-hp unit delivers 4.2 cfm of air and the $\frac{1}{2}$-hp model has an output of 1.9 cfm. The compressor line is au-



tomatically oiled. The unit has directional fins for uniform cooling. The compressors are equipped with an air tank to eliminate pulsation of delivered air and to collect moisture. Tanks have a drain valve. DeVilbiss Co.

FOR MORE DATA CIRCLE NO. 7 ON REPLY CARD

Seamless Tubing Steel

. . . resists oxidation

An alloy steel designed for use in equipment operating under conditions involving high stresses and temperatures is available in seamless tubular form, according to the announcement of Tubular Products Division.

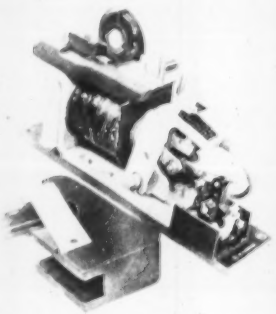
By utilizing the hot extrusion production process they make Universal Cyclops Uniloy 19-9 DL alloy available in a limited size range in seamless tubing. It possesses great strength at temperatures up to 1200 F and has been used successfully at somewhat higher temperatures for some applications. Babcock & Wilcox Co.

FOR MORE DATA CIRCLE NO. 8 ON REPLY CARD

Copper-Graphite Contacts

. . . for high conductivity factor

Electrical contacts made from copper graphite by powder metallurgy processes are offered by Gib-



son. They are designed for use when high conductivity, non-sticking properties and economy are factors.

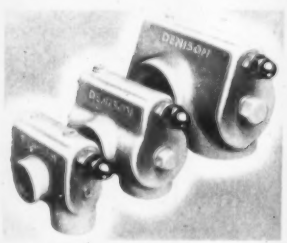
The Gibsiloy UC-5 and UC-7 powder metal contacts are regarded as an improvement over copper graphite contacts made by impregnating graphite with copper. The process is claimed to impart high electrical conductivity and greater mechanical strength to Gibsiloy UC-5 and UC-7, which are capable of handling heavy currents without contact sticking. Gibson Electric Co.

FOR MORE DATA CIRCLE NO. 9 ON REPLY CARD

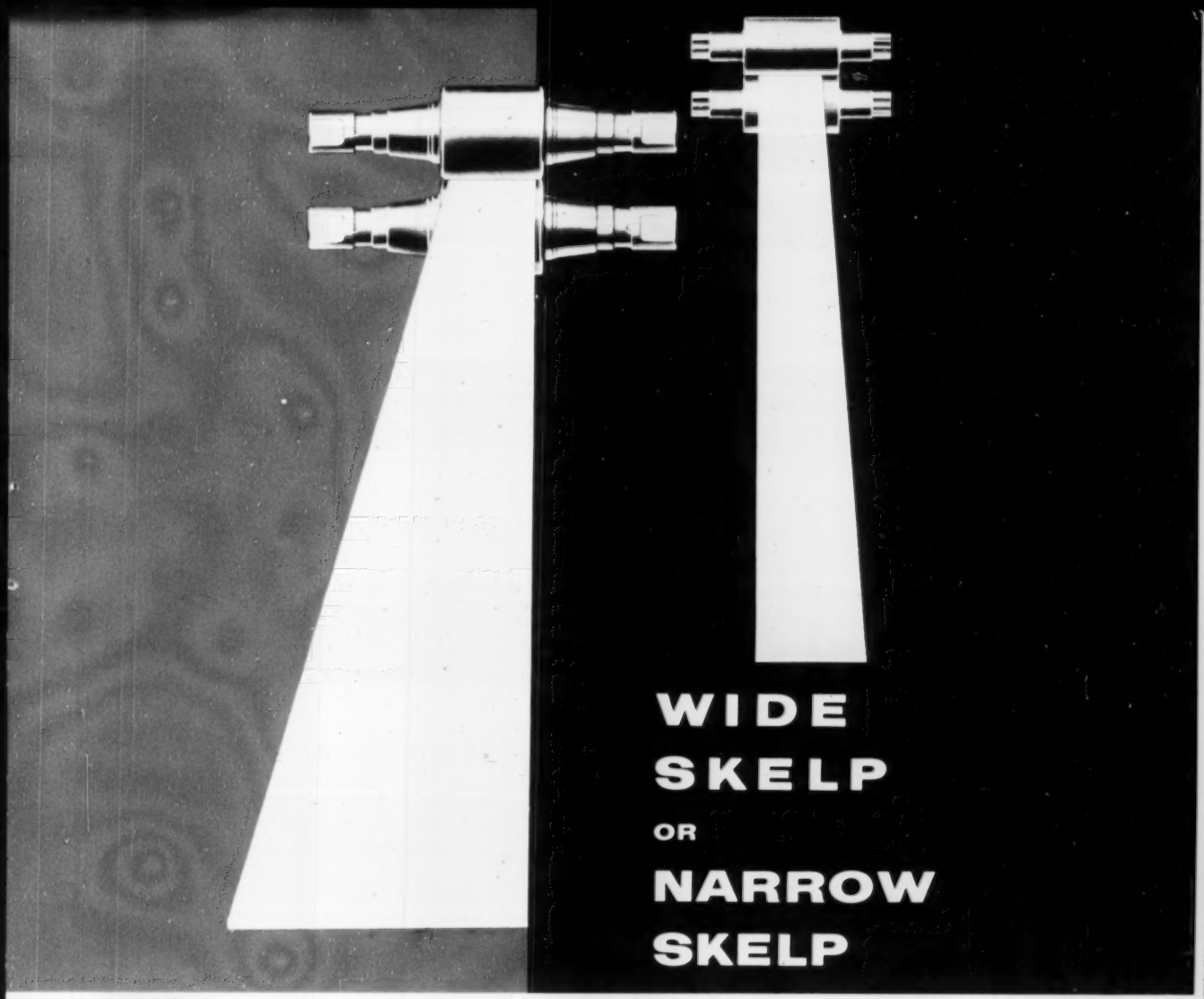
Relief Valves

. . . regulated by one screw

A new line of relief valves designed for pressure control in 2000-psi hydraulic circuits has been introduced by Denison.



The valves, which are light and compact in construction, are fur-



There's a STRIPED RED WABBLER for every type of mill

Mills for rolling skelp are of so many different types that specifications for the proper Striped Red Wabbler Rolls vary greatly.

But the important thing to remember is that Mack-Hemp Rolls have been used on *every* type of skelp mill—including the most modern and the oldest.

When you combine this roll application know-how with the skill of your own operating staff, you're putting together a real productioneering team. Add to that the specialized roll manufacturing experience of Mackintosh-Hemphill and skelp rolling will no longer be a manufacturing problem.

That's why it's always a good idea to keep an eye on what's new at Mack-Hemp.

MACKINTOSH-HEMPHILL COMPANY

Makers of the Rolls with the Striped Red Wabblers

PITTSBURGH AND MIDLAND, PA.

MACKINTOSH-HEMPHILL PRODUCTS INCLUDE: all types of cast mill rolls . . . improved Johnston patented corrugated cinder pots and slag handling equipment . . . Mackintosh-Hemphill rotary straighteners—electronically controlled contouring lathes—screw feed roll turning lathes—heavy duty engine lathes . . . shears . . . end-thrust bearings . . . steel and special alloy castings . . . reversing hot strip mills . . . Y-type cold strip mills

Just as a catcher needs protection . . .

IRON and STEEL
***Need* PROTECTION**

If your product is made of iron or steel, and exposed to the elements, protect it against the ravages of rust by Hot-Dip Galvanizing — the best possible rust preventive when applied by Hanlon-Gregory. For longer life, greater uninterrupted service and substantial savings in maintenance, specify Hot-Dip Galvanizing . . . SEAL IT IN ZINC.

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Pittsburgh, Pennsylvania
The World's largest Job Galvanizing Plant

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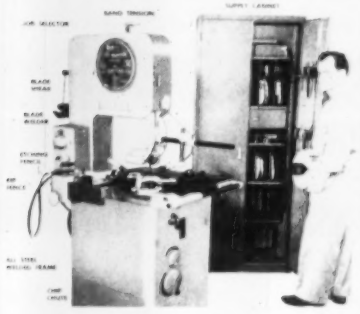
nished with threaded bodies for in-the-line or tee'd connections. Available in pipe sizes of $\frac{1}{2}$, $\frac{3}{4}$, $1\frac{1}{4}$ and $1\frac{1}{2}$ inches, they are vented or operated by remote control. Pressure settings are regulated by adjusting a single screw. A removable acorn nut covers the pressure screw for positive oil seal. The 2000-psi relief valves can also be used as safety valves for volumes greater than their rated capacities. Denison Engineering Co.

FOR MORE DATA CIRCLE NO. 30 ON REPLY CARD

Band Saw Machine

. . . capable of many tasks

A new line of 16-inch band machines with 12-inch thickness capacity for shop use are powered for tough, straight or curved metal sawing operations. They are, according to the manufacturer, more adequate for sawing woods, plastics and numerous other materials, and are easily arranged for



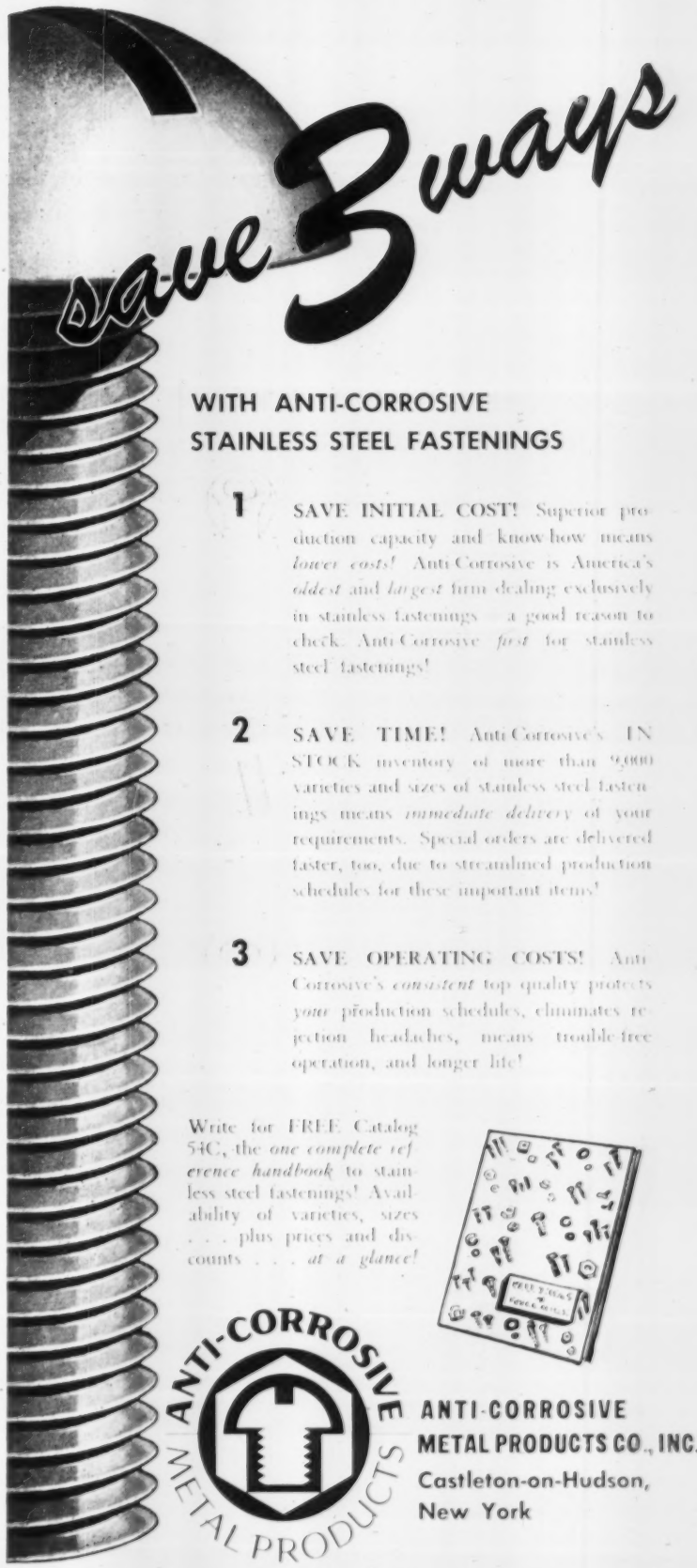
band filing, metal polishing and carbide finishing as well as slicing of hundreds of other materials by applying the proper band tool, tool guides and the use of inexpensive attachments and accessories built for the machine. Carbide tools can be finished on these machines, an operation added to the long list of profitable applications for band machines. DoAll Co.

FOR MORE DATA CIRCLE NO. 31 ON REPLY CARD

Projection Welder

. . . 12, 18, 24-inch throats

Model EPT 2 machine is one of a series of three-phase welders available in 50, 75 and 100 kva at 50 per cent duty cycle. Welder can be supplied in 12, 18 and 24-



WITH ANTI-CORROSIVE STAINLESS STEEL FASTENINGS

1 SAVE INITIAL COST! Superior production capacity and know-how means *lower costs!* Anti-Corrosive is America's *oldest* and *largest* firm dealing exclusively in stainless fastenings — a good reason to check Anti-Corrosive *first* for stainless steel fastenings!

2 SAVE TIME! Anti-Corrosive's IN STOCK inventory of more than 9,000 varieties and sizes of stainless steel fastenings means *immediate delivery* of your requirements. Special orders are delivered faster, too, due to streamlined production schedules for these important items!

3 SAVE OPERATING COSTS! Anti-Corrosive's *consistent* top quality protects *your* production schedules, eliminates rejection headaches, means trouble-free operation, and longer life!

Write for FREE Catalog 54C, the *one complete reference handbook* to stainless steel fastenings! Availability of varieties, sizes . . . plus prices and discounts . . . *at a glance!*

ANTI-CORROSIVE METAL PRODUCTS

ANTI-CORROSIVE METAL PRODUCTS CO., INC.
Castleton-on-Hudson, New York

-inch throat depths and with maximum electrode force of 4000 pounds.

Model is available as a combination projection and spot welder, the ESPT, which will make spot welds on large production runs on two thicknesses of clean mild steel in minimum gages of 0.020 and maximum gages of 0.203 inch. The latter model will also spot weld two thicknesses of stainless, aluminum and other light alloys Sciaky Bros. Inc.

FOR MORE DATA CIRCLE NO. 12 ON REPLY CARD

Copper Strip

. . . new, close-tolerance grade

Beryllium copper strip is available from Penn Precision Products. In addition to usual sizes and tempers, a new close-tolerance grade, Microstrip, is being supplied.

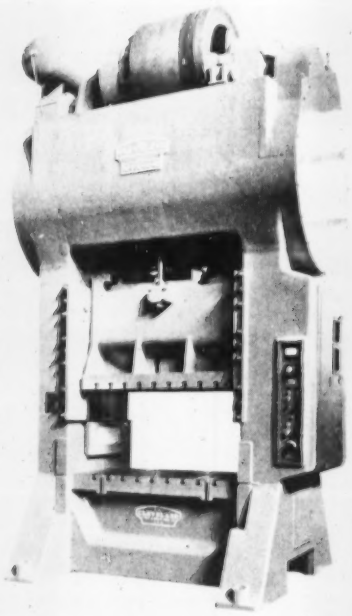
Available thicknesses run from 0.001 to 0.032 inch, with minimum tolerances ranging from ±0.0001 to ±0.0004 inch, depending on thickness. On widths from 3/32 to 5 inches, tolerances of ±0.001 and ±0.002 are regularly held. Penn Precision Products Inc.

FOR MORE DATA CIRCLE NO. 13 ON REPLY CARD

Two Point Press

. . . with lighted die area

This Cleveland Two-Point Press is double geared, twin drive and is equipped with electrically controlled, air operated drum type friction clutch with spring loaded brake.



The press has a stroke of 8 inches, a 6-inch adjustment, 26-inch distance bed to slide, stroke down and adjustment up, 42-inch x 60-inch bed and slide area and operates at 20 to 40 rpm. Its capacity is 350 tons. Cleveland Punch & Shear Works Co.

FOR MORE DATA CIRCLE NO. 14 ON REPLY CARD

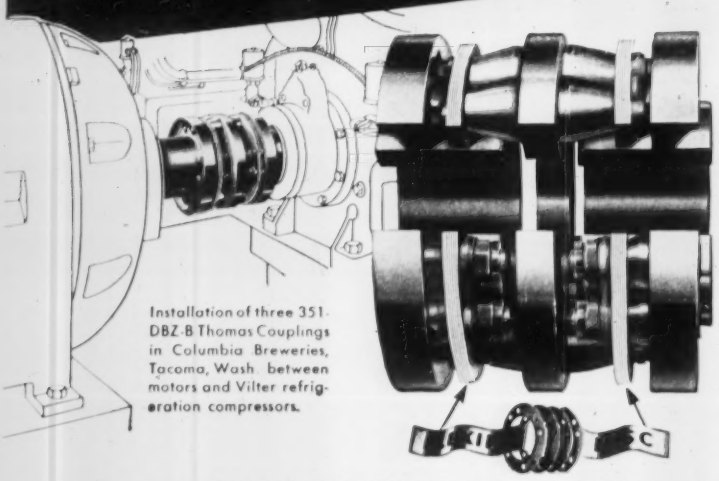
Alkyd-Type Paint

. . . a one-coat cover

An alkyd-type flat wall paint possessing qualities of durability, washability, mar resistance, uniformity of appearance and ease of application has been incorporated into Wallhide PBX flat wall paint according to the manufacturer.

Just one coat will cover evenly

THOMAS FLEXIBLE COUPLINGS...
for more years of better service!



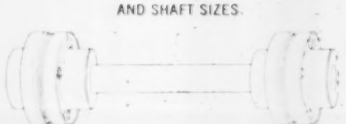
Installation of three 351-DBZ-B Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

DISTINCTIVE ADVANTAGES

FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating
NO LUBRICATION	No Wearing Parts. Freedom from Shut downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.

THOMAS COUPLINGS ARE MADE FOR A WIDE RANGE OF SPEEDS, HORSEPOWER AND SHAFT SIZES.



Write for our new Engineering Catalog No. 51A

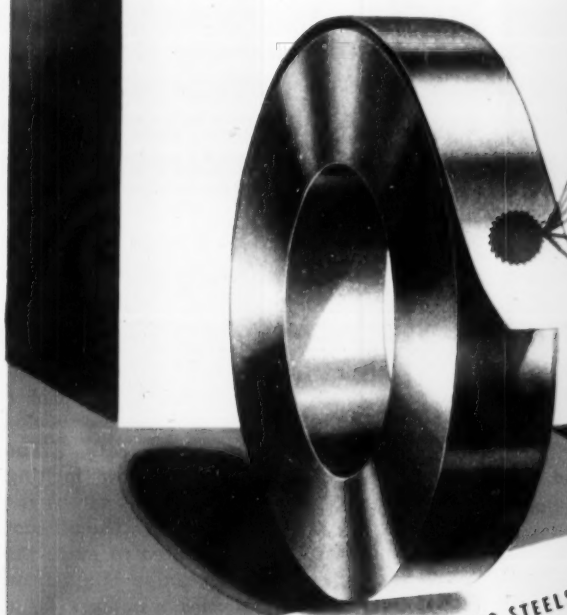
THOMAS

THOMAS FLEXIBLE COUPLING COMPANY
Largest Exclusive Coupling Manufacturer in the World
WARREN, PENNSYLVANIA, U.S.A.

SIX WAYS...

THAT SANDVIK CAN FIT YOUR SPECIALIZED SPRING STEEL REQUIREMENTS

1. PHYSICAL PROPERTIES — Sandvik quality strip steels are made in special analyses to suit specific applications.
2. HEAT TREATMENT —Furnished annealed, unannealed or hardened and tempered.
3. GAUGE — Precision-rolled in thicknesses from .001".
4. FINISH — Supplied with bright finish or polished bright, yellow or blue.
5. EDGES—Can be supplied with round edges or square edges.
6. WIDTH — Available in a wide range of standard widths.



SOME SANDVIK SPECIALTY SPRING STEELS

Band Saw Steels; Metal Band, Wood Band and Butcher Band • Camera Shutter Steel • Clock and Watch Spring Steels • Watch Parts Steels • Compressor Valve Steel • Doctor Blade Steel • Feeler Gauge Steel • Flapper Valve Steel • Knife Steels • Razor Blade Steel • Reed Steel • Shock Absorber Steel • Sinker Steel • Spring Steels • Tape and Rule Steel • Textile Steels • Trowel Steel • Vibrator Reed Steel.

Sandvik Quality Steels

SANDVIK STEEL, INC.

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Watkins 9-7180

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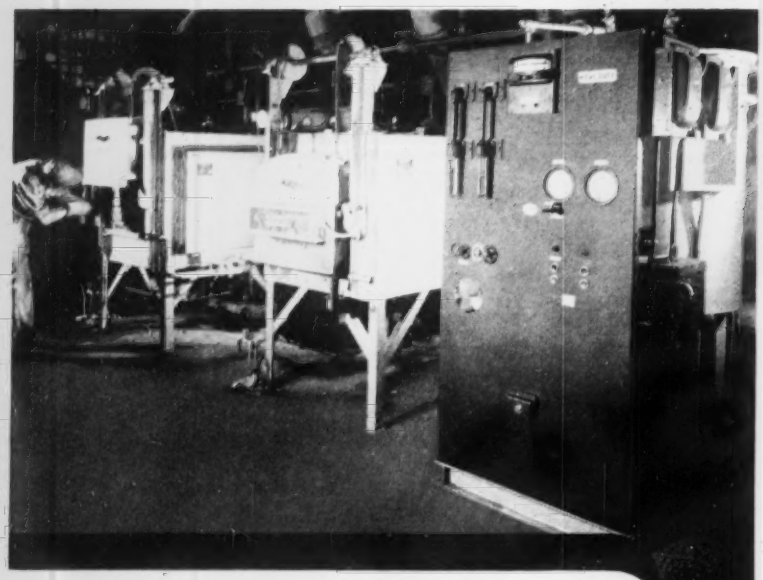


Tools and Dies
Heat Treated in...

HEVI DUTY Controlled

ATMOSPHERE FURNACES

Allis-Chalmers of Milwaukee is using Hevi Duty Controlled Atmosphere Furnaces to heat treat tools and dies made from high carbon, high chrome steels, 18-4-1, molybdenum, and cobalt high speed steels. Maintaining the exact surface carbon content of the tools and dies during heat treating is achieved with —

- A Hevi Duty Endothermic Atmosphere Generator supplying 500 cubic feet per hour of prepared atmosphere. With this controlled atmosphere, troublesome scale and decarburization or carburization of the surface is eliminated.
- A Hevi Duty Box Type Hardening Furnace, designed for temperatures to 2000° F., is used for preheating high speed steels and hardening carbon steels.
- A Hevi Duty High Temperature Furnace, designed for temperatures to 2600° F., is used to harden the high speed steels.

This combination assures you that tools and dies can be treated to exact hardness. Achieve better heat treating results by specifying Hevi Duty Furnaces. Write for Bulletin 153.

HEVI DUTY ELECTRIC COMPANY
MILWAUKEE 1, WISCONSIN
Heat Treating Furnaces... Electric Exclusively
Dry Type Transformers Constant Current Regulators

NEW PRODUCTS and equipment

over previously painted surfaces. No primer is required because the paint is self-sealing. It is easily applied by brush or roller coater, dries rapidly and has no painty odor. The finish may be washed or scrubbed repeatedly without marring it or fading its color. A wide range of colors is available. Pittsburgh Plate Glass Co.

FOR MORE DATA CIRCLE NO. 15 ON REPLY CARD

Parts Washer

. . . quick and low-cost

A compact, portable, air-powered parts washer provides a new, safe method for the speedy, economical cleaning of small parts, pieces and sub-assemblies. It consists of a leak-proof, electrically

seam-welded safety container with a fusible link in the cover and contains a perforated metal basket for the parts.

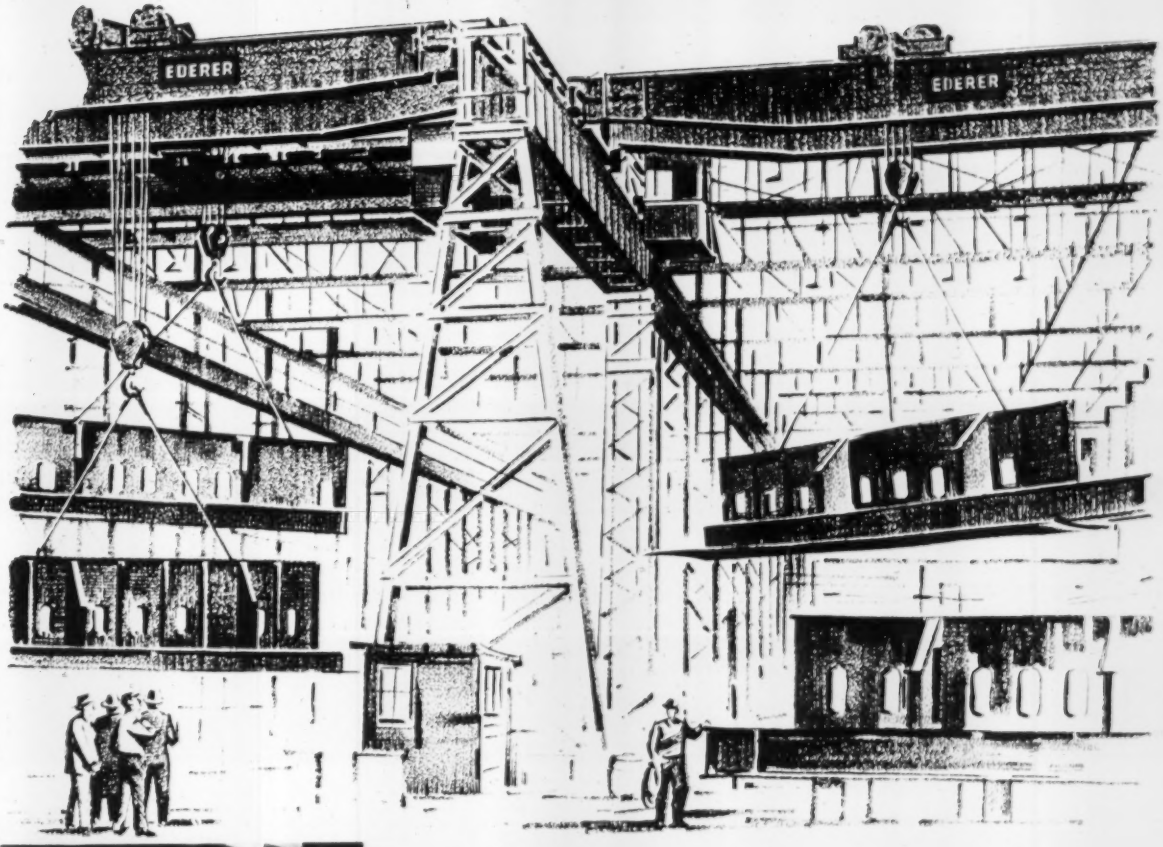
It is absolutely safe. The fusible link has a low melting point and automatically closes the cover to smother fire. The air motor may be regulated to move the basket in the cleaning liquid from 75 to 125 cycles a minute by a simple setting of the control valve. The washer will operate at air pressures between 25 pounds and 100 pounds per square inch. Protectoseal Co.

FOR MORE DATA CIRCLE NO. 16 ON REPLY CARD

Thread Comparator

. . . easily read indicator

This thread comparator is made for fast, economical visual gaging of all forms and classes of internal threads in diameters from ¾ inch to 1½ inches. Threaded parts can



Rolled steel wheels with rim-toughened treads are pressed on and keyed to axles which turn on spherical roller bearings.

Bridge drive shaft, with self-aligning ball bearing pillow blocks, has steel safety type flange couplings mounted close to wheel for easy wheel removal.

Built-in "Bigness"

assures you capacity load handling

When EDERER "job-engineers" a crane for you, it is not only designed and built to your specific materials handling requirements—it is built for heavy duty service. This basic "plus" in all EDERER cranes means oversize parts throughout, each a carefully engineered part of the whole—plenty of safety margin—operating speeds of greatest efficiency. This gives you the most in performance—the least in maintenance—full capacity load-handling at lowest cost-per-ton. If you'd like to know more about how EDERER builds "bigness" into every crane—why not send for the new EDERER crane catalog—Bulletin CR-610?

265C54

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Export Division: 301 Clay Street, San Francisco 11, California

EDERER

CRANES

OVER 50 YEARS "JOB-ENGINEERING" CRANES FOR INDUSTRY

be gaged at the inspector's bench, beside the machine or on the machine at a rate of 20 or more pieces per minute.

All classes of fit, American Standard or Unified threads, can

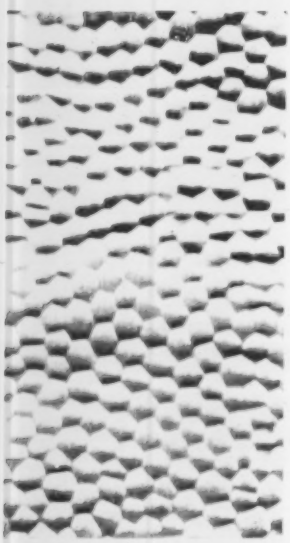
be checked with a simple adjustment of the indicator tolerance hands. One thread segment is collapsible, permitting fast loading. Easily removable, the thread segments permit interchangeability and fast setup. Hanson-Whitney Co.

FOR MORE DATA CIRCLE NO. 17 ON REPLY CARD

Hammered Metal Finish

. . . in rigid-tex metal pattern

Expensive hand-hammered metal effects are available in any metal, strip or sheet up to 38 inches wide, at a fraction of their



former hand-finished costs. The three-dimensional pattern is produced in quantity by Rigidized Metals.

Called 1-HM pattern, it has a maximum depth of 0.025-inch on metals up to 0.0312-inch thick. Rigidized Metals Corp.

FOR MORE DATA CIRCLE NO. 18 ON REPLY CARD

FREE LITERATURE

Catalogs and Clip Sheets

Reply card on page 143 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue

Weed, Grass Control

E. I. duPont de Nemours & Co.

A 10-page brochure on duPont's low-cost weed and grass control Telvar W weed killer is offered. Some of its uses are shown and the results that can be obtained are outlined and illustrated.

FOR MORE DATA CIRCLE NO. 19 ON REPLY CARD

Thermistors

General Electric Co. Carboloy Department offers a 52-page manual that will enable users to understand what Thermistors are, how they are applied, what functions they perform and what benefits industry can derive from them in detecting and compensating temperatures, and providing time delay or surge control in electrical equipment.

FOR MORE DATA CIRCLE NO. 20 ON REPLY CARD

Metal Gratings

Penn Metal Co. Inc. A 27-page catalog offered by Penn entitled "Expanded Metal and Expanded Metal Gratings" covers such subjects as standard expanded metal, flattened expanded metal, air flow tables and fabrication. Use of the Penmetal product is amply illustrated.

FOR MORE DATA CIRCLE NO. 21 ON REPLY CARD

Burmix Burners

Eclipse Fuel Engineering Co. Eclipse offers a bulletin on their Burmix burners. Construction specifications, capacity and selection data are included with schematic drawings and illustrations.

FOR MORE DATA CIRCLE NO. 22 ON REPLY CARD

Sintering Conditions

Mellon Institute. Availability of a publication, "Sintering Conditions and Sinter Properties as Affected by Moisture and Fuel," is announced by the institute. Written by H. A. Morrissey and R. E. Powers, 22 pages give detailed information, with text supported by charts and a schematic drawing of an experimental sintering machine.

FOR MORE DATA CIRCLE NO. 23 ON REPLY CARD

Grinding Fixture

Bryant Chucking Grinder Co. Bryant's shoe-type centerless internal grinding fixture is described in a 2-page leaflet. The illustrated leaflet is complete with all essential specifications.

FOR MORE DATA CIRCLE NO. 24 ON REPLY CARD

Heat-Resistant Finishes

General Paint Corp. Descriptions and technical data on new high-heat-resisting finishes for temperatures as high as 1600 F are contained in a 4-page bulletin released by General Paint. Physical properties, applications and economic advantages of special finishes for hot metal surfaces are given, along with application directions.

FOR MORE DATA CIRCLE NO. 25 ON REPLY CARD

Turning Machine

Monarch Machine Tool Co. A 4-page brochure covers the Monarch series 61 lathe with fingertip 4-way power rapid traverse. Its advantages and applications are listed and illustrated.

FOR MORE DATA CIRCLE NO. 26 ON REPLY CARD

Control Motors and Valves

Minneapolis-Honeywell Regulator Co. Catalog 8203 covers the complete line of Honeywell industrial control motors and industrial motorized valves. Included are specifications, ordering information and a price supplement for these motors. Catalog also contains information and specifica-

Here's why

the NEW L.A. *Line*

by the Louis Allis Co.

is your BEST *electric motor* BUY

A smaller, better power package to meet new NEMA standards

with NEW MODERN STYLING

New L.A. open, drip-proof motor

plus

Improved ventilation
New conduit-box arrangement
New bearing construction
More compact design and better protection
More versatile mounting

Here you have complete use of modern motor materials, design techniques and new manufacturing methods. You also get more power in a smaller package — and clean, streamlined motor styling to add modern appearance to the equipment these new motors drive.

This new styling is completely functional. Ventilating grilles, for example, blend into the general motor design — yet they provide better protection, greater safety, admit more cooling air.

Completely enclosed housing provides protection for the new L.A. line in any mounting position — floor, sidewall, or ceiling.

Standardize now on the new L.A. line for both your product and your plant — and get the most modern motor construction available. See your nearby Louis Allis Sales Engineer today for the complete story.

Vertical NEMA C-flange Motor

NEMA D-flange Motor

NEMA C flange Motor

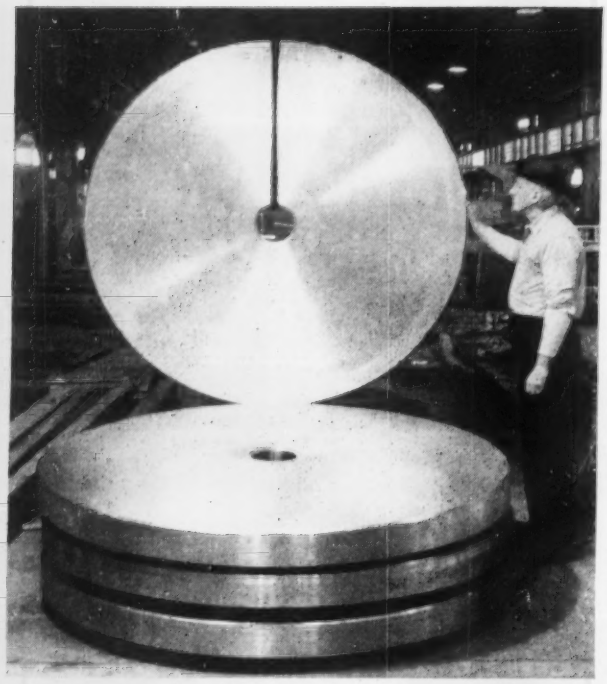
THE LOUIS ALLIS CO.

Milwaukee 7, Wisconsin

LA 102

We specialize in SPECIAL MOTORS — *and* PROMPT DELIVERY, TOO

There's a Louis Allis special motor for your toughest application. Whatever electrical or mechanical modifications you need, check first with Louis Allis.



Unusual
IS THE WORD
FOR THESE
STAINLESS STEEL
BLANKS . . .

Not Unusual
IN PRODUCTION
AT . . .

No matter how you look at it, these heavy gauge Blanks are unusual.

Unusual because they are made of Type 302 stainless steel. Unusual because they are 5" thick x 73¼" ID x 78" OD and weigh approximately 7000 pounds each. Unusual because each required special cutting and machining to produce its rough machined shape. But such jobs are *not unusual* at C. O. Carlson, Inc.

As specialists in working stainless steel, Carlson provides an unique service for you

. . . by having skilled workers produce your stainless shapes.

. . . by making full use of the specialized cutting and machining equipment at Carlson.

. . . by giving you exactly what you want "on time" to keep your production running smoothly.

. . . by eliminating shipping charges on material you cannot use.

Put your stainless steel plate requirements in good hands . . . that means, C. O. Carlson, Inc.

Stainless Steels Exclusively

CARLSON, INC.

PLATES • FORGINGS • BARS • SHEETS (No. 1 Finish)

THORNDALE, PENNSYLVANIA

District Sales Offices in Principal Cities

tions for use of industrial control motors with globe, adjustable port, butterfly valves or combinations.

FOR MORE DATA CIRCLE NO. 27 ON REPLY CARD

Steel Flooring Plates

Flash-Stone Co. Inc.—An illustrated 16-page catalog describes Ancor rolled steel flooring plates and their uses in armoring heavy-duty industrial concrete floors. Design characteristics which prevent buckling, curling or cracking and eliminate slippery surfaces and noise are described. A series of photographs illustrates installation procedure.

FOR MORE DATA CIRCLE NO. 28 ON REPLY CARD

Core Dryer Bulletin

Allis-Chalmers Mfg. Co.—How to make better cores in less time at lower cost with Foundromatic sand core dryer is told in a 12-page bulletin. Important features of the core dryer which result in simplified core making are defined. How such drying fits existing set-ups is explained. Answers are also supplied to 19 commonly asked questions concerning the operation.

FOR MORE DATA CIRCLE NO. 29 ON REPLY CARD

Strip Feed Press

Baldwin-Lima-Hamilton Corp.—The No. 401 Hamilton strip feed press for high speed production of can ends, screw caps and other light stampings is presented in the new, 4-page bulletin No. 1352. Design, operation and specifications are given.

FOR MORE DATA CIRCLE NO. 30 ON REPLY CARD

Electric Industrial Trucks

Yale & Towne Mfg. Co.—How to get the most out of walkie-type electric industrial trucks is presented in revised Bulletin P-1033, available from the Materials Handling Division. A cartoon technique illustrates the points. The 16-page booklet is intended to serve as a guide for the efficient operation and trouble free maintenance of the Worksaver Electric Trucks.

FOR MORE DATA CIRCLE NO. 31 ON REPLY CARD

Alloy Tubing Steel

Babcock & Wilcox Co.—Tubular Products Division offers bulletin TDC 151, discussing alloy tubing steels used in elevated temperature service. The bulletin discusses

USE A CARD

FREE CATALOGS and LITERATURE

NEW PRODUCT INFORMATION

INFORMATION ON ADVERTISED PRODUCTS

FREE EDITORIAL CLIP SHEETS

Croloy 9 M (8 to 10 per cent chromium, 1 per cent molybdenum). Included are data on mechanical and physical properties, bending, welding and heat treatment.

FOR MORE DATA CIRCLE NO. 32 ON REPLY CARD

Faceguard

Mine Safety Appliances Co.—Features of the MSA Faceguard are completely covered in a bulletin just announced. A schematic drawing of the mask identifies all its parts, and its features and advantages are described. The Superguard Faceshield and Chest-Mounted Faceshields are also briefly described in the 4-page bulletin.

FOR MORE DATA CIRCLE NO. 33 ON REPLY CARD

Corrosion Resisting Steel

Bethlehem Steel Co.—Mayari-R is described in a 66-page catalog. This high-strength corrosion-resisting steel, its properties, features and advantages are covered. Wear and corrosion-resistant properties in industrial equipment and equipment for the construction industry in bridges, pipe and penstocks and in mining, transportation and marine construction are discussed and illustrated.

FOR MORE DATA CIRCLE NO. 34 ON REPLY CARD

Electric Heat

General Electric Co.—GE offers an 8-page booklet, "Electric Heat in Industry." Booklet covers their Therma-Fin Unit providing temperature control, their Combustion furnaces, industrial heaters. Plant applications are described and illustrated.

FOR MORE DATA CIRCLE NO. 35 ON REPLY CARD

Surface Grinders

Thompson Grinder Co.—This company announces a colorful new catalog on its type B hydraulic surface grinders, in size range from 6 x 18 to 12 x 120 inches. The 10-page book contains complete features and specifications, with location of all main controls. Clearance drawings and wheel sizes are given for each machine.

FOR MORE DATA CIRCLE NO. 36 ON REPLY CARD

Zinc Die Casting

New Jersey Zinc Co.—The part played by zinc die casting in the design and operation of some of our modern home appliances is told in a feature story of the latest issue of the Horse Head bulletin. Another item deals with rubber insulation containing zinc oxide which showed no deterioration after nearly 30 years service in a submarine cable installation.

FOR MORE DATA CIRCLE NO. 37 ON REPLY CARD

Locomotive Roundup

Davenport Besler Corp.—"The Davenport Story" is told briefly in the 6-page bulletin 301. It's a picture story of the development of Davenport's locomotive from 1900 to 1953. Steam, diesel and diesel mechanical and torque converter locomotives are shown for a range of jobs including mainline, branch line, switching, industrial and special purpose.

FOR MORE DATA CIRCLE NO. 38 ON REPLY CARD

Masonry Drill

United Drill & Tool Corp., Chicago-Latrobe Division has issued a folder covering its fast spiral masonry drills. Covered are sets and specifications on all sizes, with advantages and applications detailed.

FOR MORE DATA CIRCLE NO. 39 ON REPLY CARD

Pressure Processing

Hydraulic Press Mfg. Co.—HPM announces a 4-page bulletin show-

For free literature, editorial clips or more information on products described in this issue, circle the corresponding number at left—or fill in box below.

1	11	21	31	41	51	61	71	81	
2	12	22	32	42	52	62	72	82	
3	13	23	33	43	53	63	73	83	
4	14	24	34	44	54	64	74	84	
5	15	25	35	45	55	65	75	85	4-12-54
6	16	26	36	46	56	66	76	86	
7	17	27	37	47	57	67	77	87	
8	18	28	38	48	58	68	78	88	
9	19	29	39	49	59	69	79	89	
10	20	30	40	50	60	70	80	90	

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4-12-54

For free literature, editorial clips or more information on products described in this issue, circle the corresponding number at left—or fill in box below.

EDITORIAL REPRINTS:

Grinding Attachment

Carborundum Co. With announcement of the 61 Universal Backstand Idler attachment for all types of wall, bench and floor coated-abrasive backstand grinding and polishing operations, the company offers a folder describing its advantages. Adaptability, durability and price are covered.

Copper Tubing

Superior Tube Co. Properties, applications and advantages of seamless and Weldrawn Beryllium copper tubing are presented in Data Memorandum No. T-2. Mechanical and physical properties, heat treating procedures, welding and brazing methods, pickling solution, corrosion-resistance tables, standard production limit tables and tubing tolerances are listed.

Handling Cost Cutter

Automatic Transportation Co. How properly-planned materials handling can reduce production costs is explained in a nontechnical guide, "The Materials Handling Cost Cutter," edited to help the general businessman analyze his own materials handling problems.

Copper Strip

Penn Precision Products Inc. A publication makes available complete data for specifying beryllium copper precision strip. A discussion of available alloys, conditions and tempers is included, with tables covering available sizes and properties.

Indicating Recorders

Thermo Electric Co. Bulletin No. 60 illustrates and describes the Thermo Electronic indicating recorder. 8 pages cover the two types, the "potentiometer" pyrometer and resistance thermometer, their construction features and specifications.

Guaranteed Annual Wage

Top topic at forthcoming labor-management bargaining sessions will be the guaranteed annual wage, or more accurately, supplementary unemployment compensation. The issue is widely misunderstood. Its cost implications are serious. The steelworkers' David J. McDonald has presented the union's case for the GAW to more clearly define the issue for STEEL readers.

Leasing

A sound re-equipment program can increase efficiency, lower costs. Over-age, obsolete and inefficient machinery bulks suprisingly large in American industry because of inflation, unsatisfactory government depreciation rules and management inertia. "Leasing may be one way to modernize your plant. Not every one should lease, but everyone should consider the possibilities" which are outlined in a three-part STEEL series concluded in this issue.

Modern Heat Treating

New heat treating furnaces and methods of using them can cut down on materials and processing costs. Dr. Allen G. Gray, STEEL Technical Editor, tells why. This is the leadoff article in a series that will present the latest technology of each of the modern heat treating processes.

Machining Stainless

This is the second of two articles on the subject prepared by J. D. Armour, Union Drawn Steel Division, Republic Steel Corp. Mr. Armour says the machining of standard test parts in automatic screw machines, enables researchers to combine operations and approximate experience of an average user. He includes a diagnosis of 271 tool headaches.

STEEL

April 12, 1954

Market Outlook

STEEL INGOT production in the week ended yesterday lost the 1-point gain it achieved in the preceding week and slipped back to 68 per cent of capacity.

Which way will it go from here? There's a diversity of opinion. Some people think it's bound to sag some more. Others think there will be some pickup. You can find reasons for either answer, because there's a diversity of conditions across the country.

ABOVE THE AVERAGE— This diversity is reflected in steel ingot production rates in the various districts of the nation. In eight of the country's 13 districts, rates were above the national average in the week ended yesterday.

In the Chicago area at least two steel mills are rebuilding inventories of semifinished steel. Both found their reduction was carried too far.

HOPEFUL— On the West Coast, H. H. Fuller, president, Bethlehem Pacific Coast Steel Corp., says he expects increased steel demand to push its second-quarter operating rate above that of the first quarter.

Also on the West Coast, March was an improved month for bolts and nuts. The bolt and nut industry is considered a good barometer of business conditions, for fasteners are used only in conjunction with other material. The bolt and nut business was one of the very first to feel the present business decline.

IMPROVEMENT— Another industrial segment that felt the business decline early—the wire mills—is noting an improvement. In the East, wire volume, mostly in manufacturers' grades, is close to 10 per cent ahead of the early first-quarter rate. Not only are April orders improved, but some tonnage is being placed for May delivery. Bulk of the volume is for prompt shipment, however. This indicates a growing number of users have worked stocks down.

LOW LEVEL— At extremely low level is steel buying for railroad usage. This inactivity stems from the drop in the railroads' business. Freight car loadings thus far this year are 12 per cent below those of the comparable period of 1953.

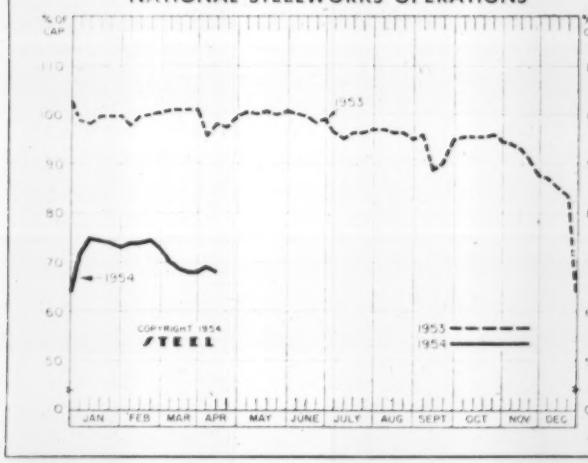
Other industrial groups are buying steel but only in small quantities, many mills and warehouses complain.

PRICE CUTS— The lowered demand for steel continues to sharpen competition for business, and scattered price cuts are resulting. In the East, one producer lowered hot-rolled and cold-rolled carbon steel sheets $1.50 a net ton. As a result, STEEL's price composite on finished steel is $113.70 a net ton, down 3 cents. Other changes in domestic prices include the abandonment of a stress-relieving price extra of 1.25 cents a pound on five grades of the chromium-type stainless steel billets and bars.

IMPORT PRICES FALL— Pressure on prices extended to imported steel also, prices on several leading grades of steel from the western European countries being down substantially.

The steelmaking scrap market, often regarded as a barometer of activity in the steel industry, saw prices go up a bit in the week ended Apr. 8. As a result, STEEL's price composite on steelmaking grades of scrap rose for the second consecutive week. A 17-cent rise put the index up to $24.50 a gross ton.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended Apr. 11	Change	Same Week 1953	Same Week 1952
Pittsburgh	71	4*	97.5	62
Chicago	73.5	3.5*	106	52.5
Mid-Atlantic	62	1	96.5	26
Youngstown	69	1	100.5	69
Wheeling	74.5	2	101	59
Cleveland	68.5	11	104	48.5
Buffalo	67.5	0	106.5	35
Birmingham	77	1.5	101	50
New England	51	14	91	67
Cincinnati	69	2	98.5	60
St. Louis	62.5	0.5	71.5	43.5
Detroit	66	23	109	91
Western	44	1	110	59.5
National Rate	68	1	98	61.5

INGOT PRODUCTION‡

	Week Ended Apr. 11	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	101.2†	102.6	102.5	138.8
NET TONS (in thousands)	1,626†	1,648	1,642	2,230

*Change from preceding week's revised rate †Estimated ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,384,549 in 1954; 2,251,450 in 1953; 2,027,040 in 1952.

PRICE INDEXES AND COMPOSITES

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics) Week Ended Apr. 6

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.400	Bars, H.R., alloy	$8.575	Strip, C.R., stainless, 430 (lb)	$0.415	Tin plate, hot-dipped, 1.25 lb	$8.433
Rails, light, 40 lb	5.767	Bars, H.R., stainless, 303 (lb)	0.418	Strip, H.R., carbon	4.975	Tin plate, electrolytic, 0.25 lb	7.133
Tie Plates	5.125	Bars, H.R., carbon	4.873	Pipe, black, buttweld (100 ft)	14.454	Black plate, can making quality	6.233
Axles, railway	7.250	Bars, reinforcing	4.900	Pipe, galv., buttweld (100 ft)	17.731	Wire, drawn, carbon	7.713
Wheels, freight car, 33 in. (per wheel)	47.000	Bars, C.F., carbon	7.960	Pipe, line (100 ft)	141.960	Wire, drawn, stainless, 430 (lb)	0.545
Plates, carbon	4.550	Bars, C.F., alloy	11.000	Casing, oil well, carbon (100 ft)	149.516	Bale ties (bundle)	5.653
Structural Shapes	4.367	Bars, C.F., stainless, 302 (lb)	0.433	Casing, oil well, alloy (100 ft)	214.113	Nails, wire, 8d common	7.488
Bars, tool steel, carbon (lb)	0.415	Sheets, H.R., carbon	4.765	Tubes, boiler (100 ft)	‡	Wire, barbed (80-rod spool)	6.847
Bars, tool steel, alloy, oil hardening die (lb)	0.505	Sheets, C.R., carbon	5.704	Tubing, mechanical, carbon (100 ft)	‡	Woven wire fence (20-rod roll)	16.174
Bars, tool steel, H.R., alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.075	Sheets, galvanized	6.945	Tubing, mechanical, stainless, 304 (100 ft)	161.193	‡ Not available.	
Bars, tool steel, H.R., alloy, high speed W 18, Cr 4, V 1 (lb)	1.550	Sheets, C.R., stainless, 302 (lb)	0.548				
		Sheets, electrical	9.000				
		Strip, C.R., carbon	7.243				

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Apr. 6 1954	Mar. 30 1954	Month Ago	Mar. Average
(1947-1949 = 100)	140.9	140.9	140.9	140.9

STEEL's FINISHED STEEL PRICE INDEX*

	Apr. 8 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av. = 100)	189.74	189.74	189.74	181.31	154.01
Index in cents per lb	5.140	5.140	5.140	4.912	4.172

STEEL's ARITHMETICAL PRICE COMPOSITES

	Apr. 8 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Finished Steel, NT*	$113.70	$113.70†	$113.70†	$110.98	$94.50
No. 2 Fdry. Pig Iron, GT	56.54	56.54	56.54	55.04	46.63
Basic Pig Iron, GT	56.04	56.04	56.04	54.66	46.16
Malleable Pig Iron, GT	57.27	57.27	57.27	55.77	47.34
Steelmaking Scrap, GT	25.33	24.50	24.17	43.33	25.50

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130. †Revised.

COMPARISON OF PRICES

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Apr. 8 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.15	4.15	4.15	3.95	3.35
Bars, H.R., Chicago	4.15	4.15	4.15	3.95	3.35
Bars, H.R., del. Philadelphia	4.405	4.405	5.302	4.502	3.816
Bars, C.F., Pittsburgh	5.20	5.20	5.20	4.925	3.95
Shapes, Std., Pittsburgh	4.10	4.10	4.10	3.85	3.25
Shapes, Std., Chicago	4.10	4.10	4.10	3.85	3.25
Shapes, del., Philadelphia	4.38	4.38	4.38	4.13	3.492
Plates, Pittsburgh	4.10	4.10	4.10	3.90	3.50
Plates, Chicago	4.10	4.10	4.10	3.90	3.40
Plates, Coatesville, Pa.	4.10	4.10	4.10	4.35	3.75
Plates, Sparrows Point, Md.	4.10	4.10	4.10	3.90	3.45
Plates, Claymont, Del.	4.10	4.10	4.10	4.35	3.65
Sheets, H.R., Pittsburgh	3.925	3.925	3.925	3.775	3.275
Sheets, H.R., Chicago	3.925	3.925	3.925	3.775	3.25
Sheets, C.R., Pittsburgh	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Chicago	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Detroit	4.975	4.975	4.975	4.775	4.20
Sheets, Galv., Pittsburgh	5.275	5.275	5.275	5.075	4.40
Strip, H.R., Pitts.	4.425	4.425	4.425-4.975	4.225	3.30
Strip, H.R., Chicago	3.925	3.925	3.925	3.725	3.30
Strip, C.R., Pittsburgh	5.45	5.45	5.45	5.10-5.80	4.375
Strip, C.R., Chicago	5.70	5.70	5.70	5.35	4.25
Strip, C.R., Detroit	5.65	5.65	5.65	5.30-6.05	4.20
Wire, Basic, Pitts.	5.525	5.525	5.525	5.225-5.475	4.15
Nails, Wire, Pittsburgh	6.55	6.55	6.55	6.35	5.20
Tin plate (1.50 lb), box, Pitts.	$8.95	$8.95	$8.95	$8.95	$7.75
SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$75.50	$75.50	$75.50	$70.50	$61.00
Wire rods, ½-⅝" Pitts.	4.525	4.525	4.525	4.425	3.775

PIG IRON, Gross Ton	Apr. 8 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bessemer, Pitts.	$57.00	$57.00	$57.00	$55.50	$48.08
Basic, Valley	56.00	56.00	56.00	54.50	46.00
Basic, deld. Phila.	59.66	59.66	59.66	59.25	50.30
No. 2 Fdry., Pitts.	56.50	56.50	56.50	55.00	47.58
No. 2 Fdry., Chicago	56.50	56.50	56.50	55.00	46.25
No. 2 Fdry., Valley	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry., del. Phila.	60.16	60.16	60.16	59.75	50.80
No. 2 Fdry., Birm.	52.88	52.88	52.88	51.38	43.38
No. 2 Fdry. (Birm.) del. Cin.	60.43	60.43	60.43	58.93	49.43
Malleable, Valley	56.50	56.50	56.50	55.00	46.50
Malleable, Chicago	56.50	56.50	56.50	55.00	46.50
Ferromanganese, Duquesne	200.00†	200.00†	200.00†	228.00*	175.00*

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pitts.	$26.50	$25.50	$25.50	$44.00	$26.50
No. 1 Heavy Melt, E. Pa.	22.00	22.00	22.00	44.50	21.50
No. 1 Heavy Melt, Chicago	27.50	26.00	25.00	41.50	25.50
No. 1 Heavy Melt, Valley	24.50	23.50	23.50	41.75	24.00
No. 1 Heavy Melt, Cleve.	21.50	20.50	20.50	42.00	22.00
No. 1 Heavy Melt, Buffalo	23.50	24.00	24.00	46.00	25.75
Rails, Rerolling, Chicago	34.50	34.50	36.50	55.00	34.00
No. 1 Cast, Chicago	36.00	33.00	31.50	44.00	34.50

COKE, Net Ton					
Beehive, Furn, Connlsvl.	$14.75	$14.75	$14.75	$14.75	$14.50
Beehive, Fdry, Connlsvl.	16.75	16.75	16.75	17.00	17.00
Oven Fdry, Chicago	24.50	24.50	24.50	24.50	20.40

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots, 21.50, pigs, 20.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 23.30; No. 43, 5% Si, 23.10; No. 142, 4% Cu, 24.40; No. 195, 4.5% Cu, 0.8% Si, 23.70; No. 214, 3.8% Mg, 24.40; No. 356, 7% Si, 0.3% Mg, 23.20.

Antimony: R.M.M. brand, 99.5% 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Texas, in bulk. Foreign brands, 99.5%, 25.50-26.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.

Beryllium Copper: 3.75-4.25% Be, $10.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa., or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb del.

Cobalt: 97-99%, $2.60 per lb for 550 lb keg, $2.62 per lb for 100 lb case, $2.67 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 29.75-30.00 del. Conn. Valley, 29.875-30.125 del. Midwest; Lake 30.00 del.; Fire refined 29.75 del.

Germanium: 99.9%, $265 per lb nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $145-$150 per troy oz.

Lead: Common 13.55, chemical 13.65, corroding 13.65, St. Louis; New York basis, add 0.20.

Lithium: 98%, $11-$14 per lb, depending on quantity.

Magnesium: 99.8%, selfpalletizing pig 27.00; notched ingot 27.75, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., and Madison, Ill., add 1.20 for pig and 1.25 for ingot. Sticks, 1.3 in. diameter, 46.00, 100 to 1000 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more, f.o.b. Freeport, Tex., or Madison, Ill. Add 1.20 for Port Newark, N. J.

Mercury: Open market, spot, New York, $210-$215 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3.10 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 60.00; 25-lb pigs 62.65; "XX" nickel shot 63.65; "F" nickel shot or

DAILY NONFERROUS PRICE RECORD

	Price Apr. 8	Last Change	Previous Price	Mar. Avg.	Feb. Avg.	Apr. 1953 Avg.
Copper	29.75-30.00	Mar. 3	29.50-30.00	29.865	29.750	30.755
Lead	13.55	Apr. 1	13.30	12.735	12.610	12.473
Zinc	10.25	Mar. 29	9.75	9.657	9.369	11.000
Tin	94.50	Apr. 7	94.25	92.518	85.181	102.567
Nickel	60.00	Jan. 14, 1953	56.50	60.000	60.000	60.000
Aluminum	21.50	July 15, 1953	20.50	21.500	21.500	20.500
Magnesium	27.00	Mar. 9, 1953	24.50	27.000	27.000	27.000

Quotations in cents per pound based on: Copper, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99+%, del.; Magnesium 99.8%, Freeport, Tex.

ingots for addition to cast iron, 60.00; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $140-$150 per troy oz nom.

Palladium: $21 per troy oz.

Platinum: $84-$87 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $125 per troy oz.

Ruthenium: $70-$75 per troy oz.

Selenium: 99.5%, $5-$6 per lb.

Sodium: 16.50, carlots; 17.00 l.c.l.

Tantalum: Sheet, rod $39.00 per lb; powder $33.50 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, New York, spot, 94.50; prompt, 94.50.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max.) $4.72; grade A-2 (0.5% Fe max.) $4.46 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000 lb lots $4.65 per lb f.o.b. shipping point; less than 1000 lb $4.80; 99+% hydrogen reduced, $4.95. Treated ingots $6.70.

Zinc: Prime Western 10.25, brass special 10.50, intermediate 10.75, E. St. Louis, freight allowed over 0.50 per pound. High grade 11.60, special high grade 11.75, die casting alloy ingot 14.25, del.

Zirconium: Sponge $10 per lb; powder electronics grade $15, flash grade $11.50.
(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston Alloys 20.50-22.00; No. 12 foundry alloy (No. 2 grade) 19.50-20.50, 5% silicon alloy, 0.60 Cu max., 22.50-23.00; 13 alloy, 0.60 Cu max., 22.50-23.00; 195 alloy 21.50-22.50; 108 alloy 20.00-21.50 steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 20.75-21.75; grade 2, 19.50-20.25; grade 3, 18.50-19.25; grade 4, 18.00-19.00.

Brass Ingot: Red brass, No. 115, 25.00; tin bronze No. 225, 36.75, No. 245, 31.00; high-leaded tin bronze, No. 305, 29.75; No. 1 yellow, No. 405, 21.15; manganese bronze No. 421, 26.25.

Magnesium Alloy Ingot: AZ63A, 31.50; AZ91B, 27.00; AZ91C, 31.50; AZ92A, 31.50.

NONFERROUS MILL PRODUCTS

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 35.36; 30,000 lb lots, 35.48; l.c.l. 35.98. Weatherproof, 100,000 lb, 36.28; 30,000 lb, 36.53; l.c. 37.03. Magnet wire del., 15,000 lb or more 41.83; l.c.l., 42.58.

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more $18.50 per cwt; pipe, full coils $18.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 100,000 lb and over, f.o.b. mill.) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forging billets, $6; hot-rolled and forged bars, $6.

ZINC

Sheets 23.00, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50, f.o.b. mill, 36,000 lb and over. Plates 19.00-22.25.

ZIRCONIUM

Plate $27; H.R. strip $28; C.R. strip $35; forged or H.R. bars $27; wire, 0.015 in., 1 cent per linear foot.

	NICKEL, "A" Nickel	MONEL, Monel	INCONEL, Inconel
Sheet, C.R.	86.5	67.5	92.5
Strip, C.R.	92.5	70.5	98.5
Plate, H.R.	84.5	66.5	90.5
Rod, Shapes	82.5	65.5	88.5
Seamless Tubes	115.5	100.5	137.5
Shot, Blocks	....	60.0	....

ALUMINUM

(30,000 lb base; freight allowed over 499 lb)
Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet*	Coiled Sheet	Coiled Sheet Circle†
0.249-0.136	12-48	33.9	...	...
0.135-0.096	12-48	34.4	...	...
0.095-0.077	12-48	35.1	32.7	37.5
0.076-0.061	12-48	35.7	32.9	37.7
0.060-0.048	12-48	36.1	33.2	38.1
0.047-0.038	12-48	36.6	33.6	38.4
0.037-0.030	12-48	37.0	34.0	39.1
0.029-0.024	12-48	37.6	34.3	39.6
0.023-0.019	12-36	38.3	35.1	40.4
0.018-0.017	12-36	39.1	35.7	41.3
0.016-0.015	12-36	40.0	36.5	42.5
0.014	12-24	41.0	37.5	43.8
0.013-0.012	12-24	42.1	38.2	44.8
0.011	12-24	43.1	39.4	46.4
0.010-0.0095	12-24	44.3	40.5	48.0
0.009-0.0085	12-24	45.6	41.9	50.0
0.008-0.0075	12-24	47.1	43.1	51.8
0.007	12-18	48.6	44.6	54.1
0.006	12-18	50.2	46.0	59.1

* 72-180 in. lengths. † 26 in. max. dia.

AUMINUM

Plates and Circles: Thickness 0.250-3.0 in., 24-60 in. width or dia., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
2S-F, 3S-F	32.4	36.3
50S-F	33.5	37.4
48-F	34.5	39.1
52S-F	36.2	40.9
61S-T6	37.4	41.5
24S-T4*	39.3	45.4
75S-T6*	47.1	53.7

* 24-48 in. widths or dia., 72-180 in. lengths.

AUMINUM

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or across flats	Round 11S-T3	Round 17S-T4	Hexagonal 11S-T3	Hexagonal 17S-T4
Drawn				
0.125	59.6	57.9	...	...
0.156-0.172	50.6	48.9	...	...
0.188	50.6	48.9	...	62.4
0.219-0.234	47.9	46.2	...	...
0.250-0.281	47.9	46.2	...	59.5
0.313	47.9	46.2	...	56.8
Cold-finished				
0.375-0.531	46.6	44.9	56.2	53.4
0.563-0.688	46.6	44.9	53.4	50.2
0.750-1.000	45.5	43.8	48.9	47.3
1.063	45.5	43.8	...	45.7
1.125-1.500	43.8	42.1	47.3	45.7
Rolled				
1.563	42.7	41.0	...	...
1.625-2.000	42.1	40.4	...	44.1
2.125-2.500	41.1	39.4	...	...
2.750-3.375	39.9	38.2	...	...

AUMINUM

Forging Stock: Round, Class 1, 43.8-34.4, in specific lengths 36-144 in. diameters 0.375-8 in.; rectangles and squares, Class 1, 50.2-38.4 in random lengths 0.375-4.0 in. thick, widths 0.750-10.0 in.

Pipe: A.S.A. Schedule 40, alloy 63S-T6, 20 ft length, plain ends, 90,000 lb base, per 100 ft.

Nom. pipe size, in.		Nom. pipe size, in.	
⅜	$15.05	2	$ 46.30
1	23.65	4	127.70
1¼	32.00	6	228.50
1½	38.25	8	343.80

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 94.00, 0.064-in. 73.00, 0.125-in. 60.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled AZ31, 53.00, 20,000 lb or more 0.250-in. and over, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 59.00, 20,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in. 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ¼-in. 67.00. Channels, 5 in. 67.80. I-Beams, 5 in. 66.20.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate,	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.38b	45.98c	....	48.44	26.000	26.000	25.250
Yellow Brass	41.72	33.50d	42.26	44.63	19.750	19.500	18.000
Red Brass, 85%	45.44	45.38	45.98	48.25	23.000	22.750	22.250
Low Brass, 80%	44.47	44.41	45.01	47.28	22.125	21.875	21.375
Naval Brass	45.76	40.07	52.80	48.92	18.250	18.000	17.500
Commercial Bronze, 90%	46.95	46.89	47.49	49.51	23.875	23.625	23.125
Nickel Silver, 10%	55.36	59.43g	57.69	....	23.625	23.375	11.813
Phosphor Bronze, A, 5%	66.58	67.08	67.08	68.23	26.125	25.875	24.875
Silicon Bronze	52.71	51.90	52.75	70.11e	25.125	24.875	24.125
Manganese Bronze	49.48	43.62	54.06	....	18.250	18.000	17.500
Muntz Metal	43.96	39.77	....	....	18.625	18.375	17.875

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 2S clippings 12.00; low copper clippings 12.00; mixed clippings 10.00-11.00; old sheet 9.50-10.00; borings and turnings 6.50; pistons and struts 6.50; crankcases 9.50-10.00; industrial castings 9.50-10.00.

Copper and Brass: Heavy copper and wire, No. 1 24.00; No. 2 copper 22.50; light copper 20.50; No. 1 composition red brass 17.50; No. 1 composition turnings 17.00; mixed brass turnings 12.50; new brass clippings 11.00; No. 1 brass rod turnings 13.50; light brass 15.00; heavy yellow brass 13.50; new brass rod ends 15.00; auto radiators, unsweated 13.50; cocks and faucets 15.00; brass pipe 16.25.

Lead: Heavy 10.50-11.00; battery plate 5.75-6.00 linotype and stereotype 12.25, electrotype 11.00; mixed babbitt 12.50.

Magnesium: Clippings 18.50-19.50; clean castings 17.50-18.50; iron castings, not over 10% removable Fe, 16.50-17.50.

Monel: Clippings 24.00-26.00; old sheet 22.00-24.00; turnings 16.00-18.00; rods 23.00-25.00.

Nickel: Sheets and clips 60.00-65.00; rolled anodes 60.00-65.00; turnings 40.00; rod ends 60.00-65.00.

Tin: No. 1 pewter 50.00-55.00; block tin pipe 70.00-75.00; No. 1 babbitt 40.00-45.00.

Zinc: Old zinc, 4.50; new die cast scrap, 4.00; old die cast scrap, 3.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 2S, 3S clippings 15.00-15.50; 51S, 52S clippings 15.00-15.50; 14S, 17S, 24S clippings 14.00-14.50; mixed clippings 14.00-14.50; old sheet 12.50-13.00; old cast 12.50-13.00; clean old cable, free of steel 15.00-15.50; borings and turnings 12.50-13.50.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 26.25; No. 2 copper 24.75; light copper 23.25; refinery brass (60% copper) per dry copper content 21.50-22.00; auto radiators, 15.50, nominal.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 26.25; No. 2 copper 24.75; light copper 23.25; No. 1 composition borings 19.00-19.50; No. 1 composition solids 19.50-20.00; heavy yellow brass solids 15.00-15.25; yellow brass turnings 14.00-14.25; radiators 15.50.

PLATING MATERIALS

(F.o.b. shipping points, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.75 per lb.

Copper: Flat-rolled 45.04, oval 44.54, 2000-5000 lb; electrodeposited 39.78, cast 42.04, 5000-10,000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb $1.105; 200-499 lb $1.09, 500-999 lb $1.085; 1000 lb or more $1.08.

Zinc: Bar 18.50, bar or flat top 17.50, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100 lb drums.

Chromic Acid: Less than 10,000 lb 28.50; over 10,000 lb 27.50.

Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.50.

Copper Sulphate: 100-9000 lb 11.35; 9000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00, 200 lb 43.00; 300 lb 42.00; 400-4500 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulphate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,000 lb 30.00; 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 78.50; 25,000 oz and over 77.325.

Sodium Cyanide: Egg, under 10000 lb 19.80, 10000-19,900 lb 18.80, 20,000 lb and over 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb 70.6; 100-500 lb 56.3; 500-1000 lb 53.9; 2000-9900 lb 52.1; 10,000 lb or more 51.0.

Stannous Chloride (Anhydrous): Less than 50 lb $1.564; 50 lb $1.224; 100-300 lb $1.074; 400-900 lb $1.049; 1000-1900 lb $1.025; 2000-4900 lb 98.8; 5000-19,000 lb 92.7; 20,000 lb and over 86.6.

Stannous Sulphate: Less than 50 lb $1.264; 50 lb 96.4; 100-1900 lb 94.4; 2000 lb and over 92.4.

Zinc Cyanide: Under 1000 lb 54.30, 1000 lb and over 52.30.

Nonferrous Metals

Don't expect quick action on national stockpiling of metals. The government need be in no hurry. Mere announcement of its policy shored up the nonferrous market

QUICK action isn't likely on metals stockpiling.

The government plan to shore up the mining industry will be used as a sword as well as a shield. While no one wants to go on record with his explanation for the delay, it's really quite simple. Mere announcement of the new policy, carefully preplanned, is serving its purpose well.

Flip-Flop It stirred up enough buying enthusiasm to yank the market off bottom. It jacked up sales, prices and producers' state of mind. All this came about without a cent being spent. Even details of the plan are lacking, yet in a month's time market sentiment has undergone a complete reversal.

Washington officials feel they must proceed carefully in adding tonnages of the 35-40 metals to the national stockpile. This way they hope to achieve maximum mileage from the dole in terms of economic benefit to metals.

Dangers Immediate purchases not only would dry up funds but also risk further recurrence of depressed conditions. There's also danger of falsely stimulating prices that might entice producers to open up marginal facilities here or abroad.

Also awaited are lead and zinc tariff recommendations, expected Apr. 20. Stockpile planning must be meshed with recovery of these two metals, as they contributed largely to the need for government action. All signs point to an increase of about one cent a pound on each metal, despite free trade appeals by the administration.

Chile Cuts Copper Output

Production cuts in Chilean copper of 30 per cent have been effected; first-quarter output was off better than 17 per cent from last year's average. The 20,700 tons monthly now produced in Chile compares with about 29,500 tons monthly last fall.

With U. S. output now reduced by nearly 15,000 tons monthly, world supply is in the neighborhood of 182,000 tons, about matching current consumption. Offsetting the cuts is the fact that new facilities will be adding over 12,000 tons a month to domestic supply by year end, though they are protected by government floor price contracts.

The new stockpiling program of the U. S. is hailed in Chile as opening up new possibilities for sale of additional quantities of copper to the U. S., says Bache & Co., New York. Its market letter points out that the Chilean government still exercises control over about 80,000 tons of unsold copper. Sale of 10,000 tons of this to Britain has been authorized with payment in pound sterling. A German trade mission is also reportedly seeking a substantial tonnage.

STEEL's Metal Price Averages for Mar., 1954

(Cents per pound)

Electrolytic Copper, del. Conn.	29.865
Lead, St. Louis	12.735
Prime Western Zinc, E. St. Louis	9.657
Straits Tin, New York	92.518
Primary Aluminum Ingots, del.	21.500
Magnesium, Freeport, Tex.	27.000
Nickel, f.o.b. refinery	60.000

Aluminum Cans—When?

Aluminum companies have always eyed covetously the big market for metal cans—38 billion cans were shipped last year alone. Aluminum cans are under vigorous research by both aluminum firms and can companies, but so far no flux or welding material has been developed to match the processing speed of solder.

A poke at prices was taken last week at the American Management Association's Packaging Conference in Atlantic City, N. J., by John A. Warren, American Home Products Corp., New York. Said he, "Aluminum cans will not be a serious threat to tin cans until the price differential between aluminum ingots and aluminum sheet is narrowed to the same proportion as that between steel ingot and electrolytic tin plate." Aluminum companies say this is primarily a matter of attaining sufficient volume to keep a mill rolling only canmaking stock.

Zinc News both Good and Bad

Zinc stocks in March topped the 200,000-ton mark for the first time in over seven years, but the rest of the statistical news was good. Shipments were highest since last July, unfilled orders highest since June. Daily average production slipped to 2296 tons and is considered under control. Total production was 71,186 tons, shipments 70,009 tons, stocks at month-end 201,071 tons and backlog 37,209 tons. High-grade zinc was the only category showing a stock increase, as special high grade, intermediate and prime western slipped slightly.

Market Memos

- Another demand for a 25-cent-per-hour wage increase faces nonferrous metals companies doing business with International Union of Mine, Mill & Smelter Workers. Past demands were proved bluffs.
- Aluminum scrap is edging deeper into shortage with increased exports and less industrial scrap being generated in form of clippings, borings and turnings. Higher ingot prices posted by secondary smelters and higher bids by dealers to get scrap are open evidences of this condition. About 14 per cent of our aluminum comes from secondary sources, and a shrinkage of up to 20 per cent is predicted for this sector in 1954.
- Lead shipments are highest in many months, but batterymakers haven't hit their buying stride yet. Their big orders start coming along in May.
- Factors keeping tin in equilibrium are reopening of New York ports after the half-billion dollar strike, balancing gravity of developments in the Far East.
- Will there be a second stockpile subject to being unloaded on the market by executive order? This question was posed by Montana's Senator Murray in asking ODM for clarification of the new stockpiling policy. He seeks guarantees that there will be no harm to the mining industry because of fluctuations in objectives.

every grade of ZINC
for urgent military and
civilian requirements

SLAB ZINC

PRIME WESTERN

SELECT

BRASS SPECIAL

INTERMEDIATE

HIGH GRADE

SPECIAL HIGH GRADE

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Distributors for

AMERICAN ZINC, LEAD & SMELTING COMPANY

Columbus, O. Chicago St. Louis New York

STEEL PRICES

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on page 151. Key to footnotes, page 153.

SEMIFINISHED

INGOTS, Carbon Forging (NT)
Fontana,Calif. K1 $56.00
Munhall,Pa. U5 59.00

INGOTS, Alloy (NT)
Detroit R7 $63.00
Fontana,Calif. K1 68.00
Midland,Pa. C18 62.00
Munhall,Pa. U5 62.00

BILLETS, BLOOMS & SLABS
Carbon Rerolling (NT)
Aliquippa,Pa. J5 $62.00
Bessemer,Pa. U5 62.00
Clairton,Pa. U5 62.00
Ensley,Ala. T2 62.00
Fairfield,Ala. T2 62.00
Fontana,Calif. K1 70.00
Gary,Ind. U5 62.00
Johnstown,Pa. B2 62.00
Lackawanna,N.Y. B2 62.00
Munhall,Pa. U5 62.00
So.Chicago,Ill. U5 62.00
So.Duquesne,Pa. U5 62.00

Carbon, Forging (NT)
Aliquippa,Pa. J5 $75.50
Bessemer,Pa. U5 75.50
Buffalo,B2 75.50
Clairton,Pa. U5 75.50
Cleveland,R2 75.50
Conshohocken,Pa. A3 82.50
Detroit,R7 78.50
Ensley,Ala. T2 75.50
Fairfield,Ala. T2 75.50
Fontana,Calif. K1 83.50
Gary,Ind. U5 75.50
Geneva,Utah,C11 75.50
Houston,S5 83.50
Johnstown,Pa. B2 75.50
Lackawanna,N.Y. B2 75.50
LosAngeles,B3 85.00
Munhall,Pa. U5 75.50
Seattle,B3 89.00
So.Chicago,R2,U5,W14 75.50
So.Duquesne,Pa. U5 75.50
So.SanFrancisco,B3 85.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 $82.00
Buffalo,B2 82.00
Canton,O. R2, T7 82.00
Conshohocken,Pa. A3 89.00
Detroit,R7 84.00
Fontana,Calif. K1 101.00
Gary,Ind. U5 82.00
Houston,S5 90.00
Ind.Harbor,Ind. Y1 82.00
Johnstown,Pa. B2 82.00
Lackawanna,N.Y. B2 82.00
LosAngeles,B3 102.00
Massillon,O. R2 82.00
Midland,Pa. C18 82.00
Munhall,Pa. U5 82.00
So.Chicago,R2,U5,W14 82.00
So.Duquesne,Pa. U5 82.00
Struthers,O. Y1 82.00
Warren,O. C17 82.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo,R2 $92.50
Canton,O. R2 92.50
Cleveland,R2 92.50
Fontana,Calif. K1 113.50
Gary,Ind. U5 92.50
Massillon,O. R2 92.50
So.Chicago,Ill. R2 92.50
So.Duquesne,Pa. U5 92.50

SHEET BAR (NT)
Fontana,Calif. K1 $93.18

SKELP
Aliquippa,Pa. J5 3.85
Munhall,Pa. U5 3.75
Warren,O. R2 3.75
Youngstown,R2, U5 3.75

WIRE RODS
AlabamaCity,Ala. R2 4.525
Aliquippa,Pa. J5 4.525
Alton,Ill. L1 4.70
Buffalo,W12 4.525
Cleveland,A7 4.525
Donora,Pa. A7 4.525
Fairfield,Ala. T2 4.525
Fontana,Calif. K1 5.325
Houston,S5 4.925
Johnstown,Pa. B2 4.525
Joliet,Ill. A7 4.525
KansasCity,Mo. S5 4.865
Kokomo,Ind. C16 4.675
LosAngeles,B3 5.325
Minnequa,Colo. C10 4.775
Monessen,Pa. P7 4.525
No.Tonawanda,N.Y. B11 4.525
Pittsburg,Calif. C11 4.775
Portsmouth,P12 4.525
Roebling,N.J. R5 4.625
So.Chicago,Ill. R2 4.525
SparrowsPoint,Md. B2 4.625
Sterling,Ill.(3) N15 4.525
Struthers,O. Y1 4.525
Torrance,Calif. C11 5.325
Worcester,Mass. A7 4.825

STRUCTURALS

Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 4.10
Aliquippa,Pa. J5 4.10
Bessemer,Ala. T2 4.10
Bethlehem,Pa. B2 4.15
Clairton,Pa. U5 4.10
Fairfield,Ala. T2 4.10
Fontana,Calif. K1 4.75
Gary,Ind. U5 4.10
Geneva,Utah,C11 4.10
Houston,S5 4.50
Ind.Harbor,Ind. I-2 4.10
Johnstown,Pa. B2 4.15
KansasCity,Mo. S5 4.70
Lackawanna,N.Y. B2 4.15
LosAngeles,B3 4.80
Minnequa,Colo. C10 4.55
Munhall,Pa. U5 4.10
Niles,Calif. P1 4.90
Phoenixville,Pa. P4 4.15
Seattle,B3 4.85
So.Chicago,Ill. U5, W14 4.10
So.SanFrancisco,B3 4.75
Torrance,Calif. C11 4.80
Weirton,W.Va. W6 4.10

Wide Flange
Bethlehem,Pa. B2 4.15
Clairton,Pa. U5 4.10
Fontana,Calif. K1 5.10
Lackawanna,N.Y. B2 4.15
Munhall,Pa. U5 4.10
Phoenixville,Pa. P4 4.95
So.Chicago,Ill. U5 4.10

Alloy Stand. Shapes
Clairton,Pa. U5 5.00
Fontana,Calif. K1 6.40
Gary,Ind. U5 5.00
Munhall,Pa. U5 5.00
So.Chicago,Ill. U5 5.00

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 6.175
Bessemer,Ala. T2 6.175
Bethlehem,Pa. B2 6.20
Clairton,Pa. U5 6.175
Fairfield,Ala. T2 6.175
Fontana,Calif. K1 6.825
Gary,Ind. U5 6.175
Geneva,Utah,C11 6.175
Ind.Harbor,Ind. I-2 6.175
Ind.Harbor,Ind. Y1 6.673
Johnstown,Pa. B2 6.20
Lackawanna,N.Y. B2 6.20
LosAngeles,B3 6.85
Munhall,Pa. U5 6.175
Seattle,B3 6.90
So.Chicago,Ill. U5, W14 6.175
So.SanFrancisco,B3 6.80
Struthers,O. Y1 6.675

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 6.20
Lackawanna,N.Y. B2 6.20
Munhall,Pa. U5 6.125
So.Chicago,Ill. U5 6.125

PILING

BEARING PILES
Munhall,Pa. U5 4.10
So.Chicago,Ill. U5 4.10

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 4.925
Lackawanna,N.Y. B2 4.925
Munhall,Pa. U5 4.925
So.Chicago,Ill. U5 4.925

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 4.10
Aliquippa,Pa. J5 4.10
Ashland,Ky. (15) A10 4.10
Bessemer,Ala. T2 4.10
Clairton,Pa. U5 4.10
Claymont,Del. C22 4.10
Cleveland,J5 R2 4.10
Coatesville,Pa. L7 4.10
Conshohocken,Pa. A3 4.10
Ecorse,Mich. G5 4.30
Fairfield,Ala. T2 4.10
Fontana,Calif.(30) K1 4.75
Gary,Ind. U5 4.10
Geneva,Utah,C11 4.10
GraniteCity,Ill. G4 4.30
Harrisburg,Pa. C5 4.10
Houston,S5 4.50
Ind.Harbor,Ind. I-2, Y1 4.10
Johnstown,Pa. B2 4.10
Lackawanna,N.Y. B2 4.10
LoneStar,Tex. L6 4.10
Minneapolis,Minn. C10 4.50
Munhall,Pa. U5 4.10
Pittsburgh,J5 4.10
Riverdale,Ill. A1 4.10
Seattle,B3 5.00
Sharon,Pa. S3 4.10
So.Chicago,Ill. U5, W14 4.10
SparrowsPoint,Md. B2 4.10
Steubenville,O. W10 4.10
Warren,O. R2 4.10
Weirton,W.Va. W6 4.10
Youngstown,R2, U5, Y1 4.10

PLATES, Carbon Abras. Resist
Fontana,Calif. K1 5.90
Geneva,Utah,C11 5.25

PLATES, Wrought Iron
Economy,Pa. B14 9.50

PLATES, High-Strength Low-Alloy
Aliquippa,Pa. J5 6.25
Bessemer,Ala. T2 6.25
Clairton,Pa. U5 6.25
Cleveland,J5 6.25
Conshohocken,Pa. A3 6.25
Ecorse,Mich. G5 6.45
Fairfield,Ala. T2 6.25
Fontana,Calif.(30) K1 6.75
Gary,Ind. U5 6.25
Geneva,Utah,C11 6.25
Ind.Harbor,Ind. I-2 6.25
Ind.Harbor,Ind. Y1 6.75
Johnstown,Pa. B2 6.25
Lackawanna,N.Y. B2 6.25
Munhall,Pa. U5 6.25
Pittsburgh,J5 6.25
Seattle,B3 7.15
Sharon,Pa. S3 6.25
So.Chicago,Ill. U5, W14 6.25
SparrowsPoint,Md. B2 6.25
Youngstown,U5 6.25
Youngstown,Y1 6.75

PLATES, Alloy
Claymont,Del. C22 5.55
Coatesville,Pa. L7 5.55
Fontana,Calif. K1 6.60
Gary,Ind. U5 5.55
Johnstown,Pa. B2 5.55
Munhall,Pa. U5 5.55
Sharon,Pa. S3 5.55
So.Chicago,Ill. U5, W14 5.55
SparrowsPoint,Md. B2 5.55

FLOOR PLATES
Cleveland,J5 5.15
Conshohocken,Pa. A3 5.15
Harrisburg,Pa. C5 5.15
Ind.Harbor,Ind. I-2 5.15
Munhall,Pa. U5 5.15
So.Chicago,Ill. U5 5.15

PLATES, Ingot Iron
Ashland,c.l.(15) A10 4.35
Ashland,l.c.l.(15) A10 4.85
Cleveland,c.l. R2 4.70
Warren,O. c.l. R2 4.70

BARS

BARS, Hot-Rolled Carbon
Aliquippa,Pa. J5 4.15
Alton,Ill. L1 4.35
Atlanta,Ga. A11 4.35
Bessemer,Ala. T2 4.15
Birmingham,Ala. C15 4.15
Buffalo(31) R2 4.18
Clairton,Pa. U5 4.15
Cleveland(31) R2 4.21
Detroit R7 4.30
Ecorse,Mich. G5 4.35
Emeryville,Calif. J7 4.90
Fairfield,Ala. T2 4.15
Fairless,Pa. U5 4.30
Fontana,Calif. K1 4.85
Gary,Ind. U5 4.15
Gadsden,Ala.(31) R2 4.18
Houston,S5 4.55
Ind.Harbor,Ind. I-2, Y1 4.15
Johnstown,Pa. B2 4.15
KansasCity,Mo. S5 4.75
Lackawanna,N.Y. B2 4.15
LosAngeles,B3 4.85
Milton,Pa. M18 4.15
Minnequa,Colo. C10 4.60
Niles,Calif. P1 4.85
N.Tonawanda,N.Y. B11 4.15
Pittsburg,Calif. C11 4.85
Pittsburgh,J5 4.15
Portland,Oreg. O4 4.90
Seattle,B3, N14 4.90
So.Chicago,Ill. W14 4.15
Chicago(31) R2 4.22
So.Duquesne,Pa. U5 4.15
So.SanFran.,Calif. B3 4.90
Sterling,Ill.(3) N15 4.15
Struthers,O. Y1 4.15
Torrance,Calif. C11 4.85
Weirton,W.Va. W6 4.15
Youngstown,U5 4.15
Youngstown(31) R2 4.20

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 4.875
Buffalo,R2 4.875
Canton,O. R2, T7 4.875
Clairton,Pa. U5 4.875
Detroit,R7 4.975
Ecorse,Mich. G5 5.075
Fairless,Pa. U5 5.025
Fontana,Calif. K1 5.925
Gary,Ind. U5 4.875
Houston,S5 5.275
Ind.Harbor,Ind. I-2, Y1 4.875
Johnstown,Pa. B2 4.875
KansasCity,Mo. S5 5.475
Lackawanna,N.Y. B2 4.875
LosAngeles,B3 5.925
Massillon,O. R2 4.875
Midland,Pa. C18 4.875
So.Chicago,R2,U5,W14 4.875
So.Duquesne,Pa. U5 4.875
Struthers,O. Y1 4.875
Warren,O. C17 4.875
Youngstown,U5 4.875

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy
Aliquippa,Pa. J5 6.225
Bessemer,Ala. T2 6.225
Bethlehem,Pa. B2 6.225
Clairton,Pa. U5 6.225
Ecorse,Mich. G5 6.425
Fairfield,Ala. T2 6.225
Fontana,Calif. K1 7.475
Gary,Ind. U5 6.225
Ind.Harb.,Ind. Y1 6.725
Ind.Harb.,Ind. I-2 6.225
Johnstown,Pa. B2 6.225
Lackawanna,N.Y. B2 6.225
LosAngeles,B3 6.925
Pittsburgh,J5 6.225
Seattle,B3 6.975
So.Chicago,W14 6.225
So.Duquesne,Pa. U5 6.225
So.SanFrancisco,B3 6.975
Struthers,O. Y1 6.725
Youngstown,U5 6.225

BAR SIZE ANGLES, H.R. CARBON
Bethlehem,Pa. B2 4.35

BAR SIZE ANGLES, S. Shapes
Aliquippa,Pa. J5 4.15
Atlanta,A11 4.35
Niles,Calif.,P1 4.85
SanFrancisco,S7 5.10

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 5.00
Fontana,Calif. K1 5.925
Gary,Ind. U5 5.00
Houston,S5 5.60
KansasCity,S5 5.60
Youngstown,U5 5.00

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 5.20
BeaverFalls,Pa. M12,B2 5.20
Buffalo,B5 5.25
Camden,N.J. P13 5.65
Carnegie,Pa. C12 5.20
Chicago,W18 5.20
Cleveland,A7, C20 5.20
Detroit,P12, R7 5.35
Detroit,B5 5.40
Donora,Pa. A7 5.20
Elyria,O. W8 5.20
Franklin,Park,Ill. N5 5.20
Gary,Ind. R2 5.20
GreenBay,Wis. R7 5.20
Hammond,Ind. L2, M13 5.20
Hartford,Conn. R2 5.75
Harvey,Ill. B5 5.20
LosAngeles,R2, S30 6.65
Mansfield,Mass. B5 5.75
Massillon,O. R2, R8 5.20
Monaca,Pa. S17 5.20
Newark,N.J. W18 5.65
NewCastle,Pa.(17) B4 5.20
Pittsburgh,J5 5.20
Plymouth,Mich. P5 5.45
Putnam,Conn. W18 5.75
Readville,Mass. C14 5.75
St.Louis,Mo. M5 5.50
So.Chicago,Ill. W14 5.20
SpringCity,Pa. K3 5.65
Struthers,O. Y1 5.20
Waukegan,Ill. A7 5.20
Worcester,Mass. W19 6.10
Youngstown,F3, Y1 5.20

BARS, Cold-Finished Alloy (Turned and Ground)
Cumberland,Md.(5), C19 4.45

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 6.325
BeaverFalls,Pa. M12 6.325
Bethlehem,Pa. B2 6.325
Buffalo,B5 6.375
Camden,N.J. P13 6.50
Canton,O. R2, T7 6.325
Carnegie,Pa. C12 6.325
Chicago,W18 6.325
Cleveland,A7, C20 6.325
Detroit,R7 6.325
Detroit,P12 6.475
Detroit,B5 6.525
Donora,Pa. A7 6.325
Elyria,O. W8 6.325
Gary,Ind. R2 6.325
Hammond,Ind. L2, M13 6.325
Hartford,Conn. R2 6.775
Harvey,Ill. B5 6.325
Lackawanna,N.Y. B2 6.325
Mansfield,Mass. B5 6.775
Massillon,O. R2, R8 6.325
Midland,Pa. P18 6.325
Monaca,Pa. S17 6.325
Newark,N.J. W18 6.65
Plymouth,Mich. P5 6.525
So.Chicago,Ill. R2,W14 6.325
SpringCity,Pa. K3 6.50
Struthers,O. Y1 6.325
Warren,O. C17 6.325
Waukegan,Ill. A7 6.325
Worcester,Mass. A7 6.625
Youngstown,F3, Y1 6.325

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 4.15
Atlanta,A11 4.35
Birmingham,Ala. C15 4.15
Buffalo,R2 4.15
Cleveland,R2 4.15
Emeryville,Calif. J7 4.90
Fairfield,Ala. T2 4.15
Fairless,Pa. U5 4.30
Fontana,Calif. K1 4.85
Gary,Ind. U5 4.15
Houston,S5 4.55
Ind.Harbor,Ind. I-2, Y1 4.15
Johnstown,Pa. B2 4.15
KansasCity,Mo. S5 4.75
Lackawanna,N.Y. B2 4.15
LosAngeles,B3 4.85
Milton,Pa. M18 4.15
Minnequa,Colo. C10 4.75
Niles,Calif.,P1 4.85
Pittsburg,Calif. C11 4.85
Pittsburgh,J5 4.15
SandSprings,Okla. S5 5.00
Seattle,B3, N14 4.90
So.Chicago,Ill. R2 4.15
So.Duquesne,Pa. U5 4.15
So.SanFrancisco,B3 4.90
SparrowsPoint,Md. B2 4.15
Sterling,Ill.(4) N15 4.15
Struthers,O. Y1 4.15
Torrance,Calif. C11 4.85
Youngstown,R2 U5 4.15

BARS, Reinforcing (Fabricated, to consumers)
Johnstown, ¼-1" B2 5.55
KansasCity,S5 6.35
LosAngeles,B3 5.80
Marion,O. P11 5.55
Seattle,N14 5.80
Seattle,B3 5.55
So.SanFrancisco,B3 5.85
SparrowsPt., ⅜-1" B2 5.55
Williamsport,Pa. S19 5.45

RAIL STEEL BARS
Avis,Pa.(3) J8 4.25
ChicagoHts.(3) C2, I-2 4.65
ChicagoHts.(4) C2, I-2 4.15
Ft.Worth,Tex.(26) T4 4.65
Franklin,Pa.(3) F5 4.65
Franklin,Pa.(4) F5 4.15
Marion,O.(3) P11 4.65
Moline,Ill.(3) R2 4.15
Tonawanda(3,4) B12 4.15
Williamsport,Pa.(3) S19 4.25
Williamsport,Pa.(4) S19 5.45

BARS, Wrought Iron
Economy,Pa.(S.R.) B14 10.40
Economy,Pa.(D.R.) B14 12.90
Economy(Staybolt) B14 13.20
McK.Rks.(S.R.) F5 10.40
McK.Rks.(D.R.) F5 14.00
McK.Rks(Staybolt) F5 15.50

SHEETS

SHEETS, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity,Ala. R2 3.925
Allenport,Pa. P7 3.925
Ashland,Ky.(8) A10 3.925
Cleveland,J5 R2 3.925
Conshohocken,Pa. A3 4.075
Detroit,M1 4.125
Ecorse,Mich. G5 4.125
Fairfield,Ala. T2 3.925
Farrell,Pa. U5 3.975
Fontana,Calif. K1 4.70
Gary,Ind. U5 3.925
Geneva,Utah,C11 4.025
GraniteCity,Ill. G4 4.125
Ind.Harbor,Ind. I-2, Y1 3.925
Irvin,Pa. U5 3.925
Kokomo,Ind. C16 4.175
Mansfield,Mass. B5 4.325
Middletown,O. A10 3.925
Monessen,Pa. P7 3.925
Niles,O. N5 3.925
Pittsburgh,J5 3.925
Portsmouth,P12 3.925
Riverdale,Ill. A1 3.925
Sharon,Pa. S3 3.925
Steubenville,O. W10 3.925
Warren,O. R2 3.925
Weirton,W.Va. W6 3.925
Youngstown,U5 3.925
Zanesville,O. A10 3.925

SHEETS, Cold-Rolled Steel (Commercial quality)
AlabamaCity,Ala. R2 4.525
Allenport,Pa. P7 4.525
Ashland,Ky.(8) A10 4.525
Cleveland,J5 R2 4.525
Conshohocken,Pa. A3 4.675
Detroit,M1 4.725
Ecorse,Mich. G5 4.725
Fairfield,Ala. T2 4.525
Farrell,Pa. U5 4.575
Fontana,Calif. K1 5.325
Gary,Ind. U5 4.525
Geneva,Utah,C11 4.625
GraniteCity,Ill. G4 4.725
Ind.Harbor,Ind. I-2, Y1 4.525
Irvin,Pa. U5 4.525
Kokomo,Ind. C16 4.775
Mansfield,Mass. B5 4.925
Middletown,O. A10 4.525
Monessen,Pa. P7 4.525
Niles,O. N5 4.525
Pittsburgh,J5 4.525
Portsmouth,P12 4.525
Riverdale,Ill. A1 4.525
Sharon,Pa. S3 4.525
Steubenville,O. W10 4.525
Warren,O. R2 4.525
Weirton,W.Va. W6 4.525
Youngstown,U5 4.525
Zanesville,O. A10 4.525

SHEETS, Galvanized Steel (Commercial quality)
AlabamaCity,Ala. R2 4.525
Allenport,Pa. P7 4.525
Ashland,Ky.(8) A10 4.525
Cleveland,J5 R2 4.525
Conshohocken,Pa. A3 4.675
Detroit,M1 4.725
Ecorse,Mich. G5 4.725
Fairfield,Ala. T2 4.525
Farrell,Pa. U5 4.575
Fontana,Calif. K1 5.325
Gary,Ind. U5 4.525
Geneva,Utah,C11 4.625
GraniteCity,Ill. G4 4.725
Ind.Harbor,Ind. I-2, Y1 4.525
Irvin,Pa. U5 4.525
Kokomo,Ind. C16 4.775
Mansfield,Mass. B5 4.925
Middletown,O. A10 4.525
Monessen,Pa. P7 4.525
Niles,O. N5 4.525
Pittsburgh,J5 4.525
Portsmouth,P12 4.525
Riverdale,Ill. A1 4.525
Sharon,Pa. S3 4.525
Steubenville,O. W10 4.525
Warren,O. R2 4.525
Weirton,W.Va. W6 4.525
Youngstown,U5 4.525
Zanesville,O. A10 4.525

SHEETS, Enameling Iron
AlabamaCity,Ala. R2 4.525
Ashland,Ky.(8) A10 4.525
Cleveland,J5 R2 4.525
Conshohocken,Pa. A3 4.675
Detroit,M1 4.725
Ecorse,Mich. G5 4.725
Fairfield,Ala. T2 4.525
Farrell,Pa. U5 4.575
Fontana,Calif. K1 5.325
Gary,Ind. U5 4.525
Geneva,Utah,C11 4.625
GraniteCity,Ill. G4 4.725
Ind.Harbor,Ind. I-2, Y1 4.525
Irvin,Pa. U5 4.525
Kokomo,Ind. C16 4.775
Mansfield,Mass. B5 4.925
Middletown,O. A10 4.525
Monessen,Pa. P7 4.525
Niles,O. N5 4.525
Pittsburgh,J5 4.525
Portsmouth,P12 4.525
Riverdale,Ill. A1 4.525
Sharon,Pa. S3 4.525
Steubenville,O. W10 4.525
Warren,O. R2 4.525
Weirton,W.Va. W6 4.525
Youngstown,U5 4.525
Zanesville,O. A10 4.525

SHEETS, Aluminized Steel (Type 1)
Butler,Pa. A10 6.50
Conshohocken,Pa. A3 6.65
Detroit,M1 6.70
Ecorse,Mich. G5 6.70
Fairfield,Ala. T2 6.50
Farrell,Pa. U5 6.55
Gary,Ind. U5 6.50
Ind.Harbor,Ind. I-2, Y1 6.50
Irvin,Pa. U5 6.50
Kokomo,Ind. C16 6.75
Mansfield,Mass. B5 6.90
Middletown,O. A10 6.50
Monessen,Pa. P7 6.50
Niles,O. N5 6.50
Pittsburgh,J5 6.50
Portsmouth,P12 6.50
Riverdale,Ill. A1 6.50
Sharon,Pa. S3 6.50
Steubenville,O. W10 6.50
Warren,O. R2 6.50
Weirton,W.Va. W6 6.50
Youngstown,U5 6.50
Zanesville,O. A10 6.50

SHEETS, Aluminized Steel (Type 2)
Butler,Pa. A10 6.25
Conshohocken,Pa. A3 6.40
Detroit,M1 6.45
Ecorse,Mich. G5 6.45
Fairfield,Ala. T2 6.25
Farrell,Pa. U5 6.30
Gary,Ind. U5 6.25
Ind.Harbor,Ind. I-2, Y1 6.25
Irvin,Pa. U5 6.25
Kokomo,Ind. C16 6.50
Mansfield,Mass. B5 6.65
Middletown,O. A10 6.25
Monessen,Pa. P7 6.25
Niles,O. N5 6.25
Pittsburgh,J5 6.25
Portsmouth,P12 6.25
Riverdale,Ill. A1 6.25
Sharon,Pa. S3 6.25
Steubenville,O. W10 6.25
Warren,O. R2 6.25
Weirton,W.Va. W6 6.25
Youngstown,U5 6.25
Zanesville,O. A10 6.25

SHEETS, Stainless Steel (Type 302)
Butler,Pa. A10 22.00
Coatesville,Pa. L7 22.00
Ecorse,Mich. G5 22.00
Kokomo,Ind. C16 22.00
Middletown,O. A10 22.00
Mansfield,Mass. B5 22.00
Reading,Pa. C5 22.00
Washington,Pa. J3 22.00

SHEETS, Stainless Steel (Type 304)
Butler,Pa. A10 24.00
Coatesville,Pa. L7 24.00
Ecorse,Mich. G5 24.00
Kokomo,Ind. C16 24.00
Middletown,O. A10 24.00
Mansfield,Mass. B5 24.00
Reading,Pa. C5 24.00
Washington,Pa. J3 24.00

SHEETS, Stainless Steel (Type 316)
Butler,Pa. A10 30.00
Coatesville,Pa. L7 30.00
Ecorse,Mich. G5 30.00
Kokomo,Ind. C16 30.00
Middletown,O. A10 30.00
Mansfield,Mass. B5 30.00
Reading,Pa. C5 30.00
Washington,Pa. J3 30.00

SHEETS, Stainless Steel (Type 321)
Butler,Pa. A10 30.00
Coatesville,Pa. L7 30.00
Ecorse,Mich. G5 30.00
Kokomo,Ind. C16 30.00
Middletown,O. A10 30.00
Mansfield,Mass. B5 30.00
Reading,Pa. C5 30.00
Washington,Pa. J3 30.00

SHEETS, Stainless Steel (Type 347)
Butler,Pa. A10 30.00
Coatesville,Pa. L7 30.00
Ecorse,Mich. G5 30.00
Kokomo,Ind. C16 30.00
Middletown,O. A10 30.00
Mansfield,Mass. B5 30.00
Reading,Pa. C5 30.00
Washington,Pa. J3 30.00

SHEETS, Stainless Steel (Type 410)
Butler,Pa. A10 18.00
Coatesville,Pa. L7 18.00
Ecorse,Mich. G5 18.00
Kokomo,Ind. C16 18.00
Middletown,O. A10 18.00
Mansfield,Mass. B5 18.00
Reading,Pa. C5 18.00
Washington,Pa. J3 18.00

SHEETS, Stainless Steel (Type 430)
Butler,Pa. A10 18.00
Coatesville,Pa. L7 18.00
Ecorse,Mich. G5 18.00
Kokomo,Ind. C16 18.00
Middletown,O. A10 18.00
Mansfield,Mass. B5 18.00
Reading,Pa. C5 18.00
Washington,Pa. J3 18.00

SHEETS, Stainless Steel (Type 430F)
Butler,Pa. A10 20.00
Coatesville,Pa. L7 20.00
Ecorse,Mich. G5 20.00
Kokomo,Ind. C16 20.00
Middletown,O. A10 20.00
Mansfield,Mass. B5 20.00
Reading,Pa. C5 20.00
Washington,Pa. J3 20.00

SHEETS, Stainless Steel (Type 442)
Butler,Pa. A10 20.00
Coatesville,Pa. L7 20.00
Ecorse,Mich. G5 20.00
Kokomo,Ind. C16 20.00
Middletown,O. A10 20.00
Mansfield,Mass. B5 20.00
Reading,Pa. C5 20.00
Washington,Pa. J3 20.00

SHEETS, Stainless Steel (Type 446)
Butler,Pa. A10 20.00
Coatesville,Pa. L7 20.00
Ecorse,Mich. G5 20.00
Kokomo,Ind. C16 20.00
Middletown,O. A10 20.00
Mansfield,Mass. B5 20.00
Reading,Pa. C5 20.00
Washington,Pa. J3 20.00

Kokomo,Ind. C16 ... 4.025
Lackawanna,N.Y. B2 ... 3.925
Munhall,Pa. U5 ... 3.925
Newport,Ky. N9 ... 3.925
Niles,O. N12 ... 5.175
Pittsburg,Calif. C11 ... 4.625
Pittsburgh J5 ... 3.925
Portsmouth,O. P12 ... 3.925
Riverdale,Ill. A1 ... 3.925
Sharon,Pa. S3 ... 3.925
So.Chicago,Ill. W14 ... 3.925
SparrowsPoint,Md. B2 ... 3.925
Steubenville,O. W10 ... 3.925
Torrance,Calif. C11 ... 4.625
Warren,O. R2 ... 3.925
Weirton,W.Va. W6 ... 3.925
Youngstown U5, Y1 ... 3.925

SHEETS, H.R. (19 gage)
Alabama City,Ala. R2 ... 5.225
Dover,O. R1 ... 5.06
Kokomo,Ind. C16 ... 5.025
Mansfield,O. E6 ... .05
Niles,O. N12 ... 4.775
Torrance,Calif. C11 ... 5.875

SHEETS, H.R. (14 ga. heavier) High-Strength Low-Alloy
Cleveland J5, R2 ... 5.90
Conshohocken,Pa. A3 ... 5.90
Ecorse,Mich. G5 ... 6.10
Fairfield,Ala. T2 ... 5.90
Fontana,Calif. K1 ... 6.675
Gary,Ind. U5 ... 5.90
Ind.Harbor,Ind. I-2 ... 5.90
Ind.Harbor,Ind. Y1 ... 6.40
Irvin,Pa. U5 ... 5.90
Lackawanna(35) B2 ... 5.90
Munhall,Pa. U5 ... 5.90
Pittsburgh J5 ... 5.90
Sharon,Pa. S3 ... 5.90
So.Chicago,Ill. U5 ... 5.90
SparrowsPoint(36) B2 ... 5.90
Warren,O. R2 ... 5.90
Weirton,W.Va. W6 ... 5.90
Youngstown U5 ... 5.90
Youngstown Y1 ... 6.40

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)
Ashland,Ky.(8) A10 ... 4.175
Cleveland R2 ... 4.525
Ind.Harbor,Ind. I-2 ... 4.525
Warren,O. R2 ... 4.525

SHEETS, Cold-Rolled Steel (Commercial Quality)
Allenport,Pa. P7 ... 4.775
Cleveland J5, R2 ... 4.775
Ecorse,Mich. G5 ... 4.975
Fairfield,Ala. T2 ... 4.775
Fairless,Pa. U5 ... 4.85
Follansbee,W.Va. F4 ... 4.775
Fontana,Calif. K1 ... 5.875
Gary,Ind. U5 ... 4.775
Granite City,Ill. G4 ... 4.975
Ind.Harbor,Ind. I-2,Y1 ... 4.775
Irvin,Pa. U5 ... 4.775
Lackawanna,N.Y. B2 ... 4.775
Middletown,O. A10 ... 4.775
Pittsburg,Calif. C11 ... 5.725
Pittsburgh J5 ... 4.775
Portsmouth,O. P12 ... 4.775
SparrowsPoint,Md. B2 ... 4.775
Steubenville,O. W10 ... 4.775
Warren,O. R2 ... 4.775
Weirton,W.Va. W6 ... 4.775
Youngstown Y1 ... 4.775

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 ... 7.225
Ecorse,Mich. G5 ... 7.425
Fairless,Pa. U5 ... 7.275
Fontana,Calif. K1 ... 8.275
Gary,Ind. U5 ... 7.225
Indiana Harbor,Ind. Y1 ... 7.725
Irvin,Pa. U5 ... 7.225
Lackawanna(37) B2 ... 7.225
Pittsburgh J5 ... 7.225
SparrowsPoint (38) B2 ... 7.225
Warren,O. R2 ... 7.225
Weirton,W.Va. W6 ... 7.225
Youngstown Y1 ... 7.725

SHEETS, Cold-Rolled Ingot Iron
Cleveland R2 ... 5.375
Middletown,O. A10 ... 5.275
Warren,O. R2 ... 5.375

SHEETS, Culvert	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.325	...
Canton,O. R2	6.475	6.925
Fairfield T2	6.075	6.325
Gary,Ind. U5	6.075	6.325
Ind.Harbor I-2	6.075	6.325
Irvin,Pa. U5	6.075	6.325
Kokomo,Ind. C16	6.175	...
Martins Ferry,O. W10	6.075	...
Pitts.,Calif. C11	6.825	...
Sparrows Pt. B2	6.075	...
Torrance,Cal. C11	7.075	...

SHEETS, Culvert	Pure Iron
Ashland,Ky. A10	6.575
Fairfield,Ala. T2	6.325
Martins Ferry,O. W10	6.325

SHEETS, Gal'd No. 10 Steel
Alabama City,Ala. R2 ... 5.275
Ashland,Ky.(8) A10 ... 5.275
Canton,O. R2 ... 5.275
Delphos,O. N16 ... 5.775
Dover,O. R1 ... 5.275
Fairfield,Ala. T2 ... 5.275†
Gary,Ind. U5 ... 5.275†
Granite City,Ill. G4 ... 5.475
Ind.Harbor,Ind. I-2 ... 5.275
Irvin,Pa. U5 ... 5.275†
Kokomo,Ind. C16 ... 5.375†
Martins Ferry,O. W10 ... 5.275
Niles,O. N12 ... 5.275
Pittsburg,Calif. C11 ... 6.025†
SparrowsPoint,Md. B2 ... 5.275
Steubenville,O. W10 ... 5.275
Torrance,Calif. C11 ... 6.275†
Weirton,W.Va. W6 ... 5.275

†Based on 5c zinc.

SHEETS, Galvanized No. 10 High-Strength Low-Alloy
Irvin,Pa. U5 ... 7.925

SHEETS, Galvanized Ingot Iron No. 10 flat
Ashland,Ky.(8) A10 ... 5.525
Canton,O. R2 ... 6.025

SHEETS, Galvannealed Steel
Canton,O. R2 ... 5.825
Irvin,Pa. U5 ... 5.825†
Kokomo,Ind. C16 ... 5.925†
Niles,O. N12 ... 5.825

†Based on 5c zinc.

SHEETS, ZINCGRIP Steel
Butler,Pa. A10 ... 5.525
Middletown,O. A10 ... 5.525

SHEETS, ZINCGRIP Ingot Iron
Butler,Pa. A10 ... 5.775
Middletown,O. A10 ... 5.775

SHEETS, Electrogalvanized
Cleveland R2 (28) ... 6.125
Niles,O. R2 (28) ... 6.125
Weirton,W.Va. W6 ... 5.975

SHEETS, ALUMINIZED
Butler,Pa. A10 ... 8.625

SHEETS, Enameling Iron
Ashland,Ky.(8) A10 ... 5.175
Cleveland R2 ... 5.175
Gary,Ind. U5 ... 5.175
Granite City,Ill. G4 ... 5.375
Ind.Harbor,Ind. I-2 ... 5.175
Irvin,Pa. U5 ... 5.175
Middletown,O. A10 ... 5.175
Niles,O. N12 ... 6.525
Youngstown Y1 ... 5.175

BLUED STOCK, 29 ga.
Follansbee,W.Va. F4 ... 7.30
Follansbee(23) F4 ... 7.175
Yorkville,O. W10 ... 7.20

SHEETS, Long Terne Steel (Commercial Quality)
Beech Bottom,W.Va. W10 ... 5.675
Gary,Ind. U5 ... 5.675
Mansfield,O. E6 ... 5.675
Middletown,O. A10 ... 5.675
Niles,O. N12 ... 5.675
Weirton,W.Va. W6 ... 5.675

SHEETS, Long Terne, Ingot Iron
Middletown,O. A10 ... 6.075

SHEETS, Well Casing
Fontana,Calif. K1 ... 6.20

STRIP

STRIP, Hot-Rolled Carbon
Ala.City,Ala.(27) R2 ... 3.925
Allenport,Pa. P7 ... 3.925
Alton,Ill. L1 ... 4.10
Ashland,Ky.(8) A10 ... 3.925
Atlanta A11 ... 4.125
Bessemer,Ala. T2 ... 3.925
Birmingham,Ala. C15 ... 3.925
Bridgeport,Conn.(10) S15 3.95
Buffalo(27) R2 ... 3.925
Carnegie,Pa. S18 ... 4.425
Conshohocken,Pa. A3 ... 4.05
Detroit M1 ... 4.125
Ecorse,Mich. G5 ... 4.125
Fairfield,Ala. T2 ... 3.925
Fontana,Calif. K1 ... 4.70
Gary,Ind. U5 ... 3.925
Houston,Tex. S9 ... 4.325
Ind.Harbor,Ind. I-2,Y1 3.925
Johnstown,Pa.(25) B2 3.925
Kansas City,Mo.(9) S5 4.525
Lackawanna,N.Y.(25) B2 3.925
Los Angeles(25) B3 ... 4.675
Milton,Pa. M18 ... 3.925
Minnequa,Colo. C10 ... 5.025
New Britain(10) S15 ... 4.15
N.Tonawanda,N.Y. B11 3.925
Pittsburg,Calif. C11 ... 4.675
Portsmouth,O. P12 ... 3.925
Riverdale,Ill. A1 ... 3.925
San Francisco S7 ... 5.10
Seattle(25) B3 ... 4.925
Seattle N14 ... 4.925
Sharon,Pa. S3 ... 3.925
So.Chicago,Ill. W14 ... 3.925
So.San Francisco(25) B3 4.675
SparrowsPoint,Md. B2 ... 3.925
Torrance,Calif. C11 ... 4.675
Warren,O. R2 ... 3.925
Weirton,W.Va. W6 ... 3.925
Youngstown U5 ... 3.925

STRIP, Hot-Rolled Alloy
Bridgeport,Conn.(10) S15 6.45
Carnegie,Pa. S18 ... 6.40
Fontana,Calif. K1 ... 7.80
Gary,Ind. U5 ... 6.40
Houston,Tex. S9 ... 6.80
Kansas City,Mo. S5 ... 7.00
Los Angeles B3 ... 7.60
New Britain,Conn.(10) S15 6.45
Sharon,Pa. S3 ... 6.40
So.Chicago,Ill. W14 ... 6.40
Youngstown U5 ... 6.40

STRIP, Hot-Rolled High-Strength Low-Alloy
Bessemer,Ala. T2 ... 5.95
Conshohocken,Pa. A3 ... 5.90
Ecorse,Mich. G5 ... 6.15
Fairfield,Ala. T2 ... 5.95
Fontana,Calif. K1 ... 7.65
Gary,Ind. U5 ... 5.95
Ind.Harbor,Ind. I-2 ... 5.95
Ind.Harbor,Ind. Y1 ... 6.45
Lackawanna,N.Y. B2 ... 6.00
Los Angeles(25) B3 ... 6.70
Seattle(25) B3 ... 6.95
Sharon,Pa. S3 ... 5.95
So.San Francisco(25) B3 6.70
SparrowsPoint,Md. B2 ... 6.00
Warren,O. R2 ... 5.95
Weirton,W.Va. W6 ... 5.95
Youngstown Y1 ... 6.45
Youngstown U5 ... 5.95

STRIP, Hot-Rolled Ingot Iron
Ashland,Ky.(8) A10 ... 4.175
Warren,O. R2 ... 4.525

STRIP, Cold-Rolled Carbon
Anderson,Ind. G5 ... 5.45
Bridgeport,Conn.(10) S15 5.45
Cleveland A7, J5 ... 5.45
Dearborn,Mich. D3 ... 5.65
Detroit D2, M1, P20 ... 5.65
Dover,O. G6 ... 5.45
Ecorse,Mich. G5 ... 5.45
Follansbee,W.Va. F4 ... 5.45
Fontana,Calif. K1 ... 7.35
Franklin Park,Ill. T6 ... 5.70
Ind.Harbor,Ind. I-2 ... 5.70
Indianapolis C8 ... 5.60
Lackawanna,N.Y. B2 ... 5.45
Los Angeles C1 ... 7.50
Mattapan,Mass. T6 ... 6.10
Middletown,O. A10 ... 5.45
New Bedford,Mass. R10 ... 6.60
New Britain(10) S15 ... 5.75
New Castle,Pa. B4, E5 ... 5.45
New Haven,Conn. A7 ... 6.20
New Haven,Conn. D2 ... 5.90
Pawtucket,R.I. N8, R3 ... 6.10
Pittsburgh J5 ... 5.45
Riverdale,Ill. A1 ... 5.70
Rome,N.Y.(32) R6 ... 5.45
Sharon,Pa. S3 ... 5.45
SparrowsPoint,Md. B2 ... 5.45
Trenton,N.J. R5 ... 7.00
Wallingford,Conn. W2 ... 5.90
Warren,O.(40) T6 ... 5.45
Warren,O. B9, R2 ... 5.45
Weirton,W.Va. W6 ... 5.45
Worcester,Mass. A7 ... 6.30
Youngstown C8, Y1 ... 5.45

STRIP, Cold-Rolled Alloy Steel
Carnegie,Pa. S18 ... 12.00
Cleveland A7 ... 12.00
Dover,O. G6 ... 12.00
Fontana,Calif. K1 ... 13.65
Harrison,N.J. C18 ... 12.00
Pawtucket,R.I.(41) N8 12.15
Pawtucket,R.I.(42) N8 12.45
Sharon,Pa. S3 ... 12.00
Worcester,Mass. A7 ... 12.30
Youngstown C8 ... 12.00

STRIP, Cold-Rolled High-Strength Low-Alloy
Cleveland J5 ... 7.80
Cleveland A7 ... 8.15
Dearborn,Mich. D3 ... 7.90
Dover,O. G6 ... 8.00
Ecorse,Mich. G5 ... 8.35
Lackawanna,N.Y. B2 ... 8.15
Pittsburgh J5 ... 7.80
Sharon,Pa. S3 ... 7.80
SparrowsPoint,Md. B2 ... 8.15
Warren,O. R2 ... 7.60
Weirton,W.Va. W6 ... 8.15
Youngstown Y1 ... 8.30

STRIP, Cold-Rolled Ingot Iron
Warren,O. R2 ... 6.05

STRIP, Electrogalvanized
Dover,O. G6 ... 5.45
Warren,O. B9, T5 ... 5.45
Weirton,W.Va. W6 ... 5.45
Youngstown C8 ... 5.70

TIGHT COOPERAGE HOOP
Atlanta A11 ... 4.65
Riverdale,Ill. A1 ... 4.50
Sharon,Pa. S3 ... 4.35
Youngstown U5 ... 4.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A6 Alloy Metal Wire Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Div., H. K. Porter Co.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Products
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.
F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M16 Md. Fine & Special Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman & Scott
N2 National Supply Co.
N3 National Tube Div.
N5 Nelson Steel & Wire Co.
N6 New Eng. High Carb. Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Northwest Steel Roll. Mills
N15 Northwestern S. & W. Co.
N16 New Delphos Mfg. Co.

O1 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P20 Prod. Steel Strip Corp.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S25 Stainless Welded Products
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry

V2 Vanadium-Alloys Steel
V3 Vulkan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West Auto Mach. Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet & Tube

STRIP, Cold-Finished	0.26-	0.41-	0.61-	0.81-	1.06-
Spring Steel (Annealed)	0.40C	0.60C	0.80C	1.05C	1.35C
Bridgeport,Conn (10)	S15 5.45	7.65	8.60	10.55	12.85
Bristol,Conn W1			8.90	10.85	
Carnegie,Pa S14		7.65	8.60	10.55	12.85
Cleveland A7	5.45	7.65	8.60	10.55	12.85
Cleveland,O C7		8.00	8.60	10.55	12.85
Dearborn,Mich D3	5.65	7.85	8.80		
Detroit D2	5.65	7.85	8.80	10.55	
Dover,O G6	5.45	7.65	8.60	10.55	12.85
Franklin Park,Ill T6	5.70	7.80	8.75	10.70	13.00
Harrison,N J C18			8.90	10.85	13.15
Indianapolis C8		7.80	8.60	10.55	
Mattapan,Mass T6	6.10	7.95	8.90	10.85	13.15
New Britn,Conn (10)	S15 5.75	7.65	8.60	10.55	12.85
New Castle,Pa B3	5.45	7.65	8.60		
New Castle,Pa B5	5.45	8.00	8.60	10.55	12.85
New Haven,Conn D2	5.90	7.95	8.90	10.85	
New York W3		7.95	8.90	10.85	13.15
Pawtucket,R I (11)	N8	7.65	8.60	10.55	12.85
Pawtucket,R I (12)	N8 6.10	7.95	8.90	10.85	13.15
Shelton,Pa S3	5.45	7.65	8.60	10.55	12.85
Trenton,N J R5		7.95	8.90	10.85	13.15
Wallingford,Conn W2	5.90	7.95	8.90	10.85	13.15
Warren,O T5	5.45	7.65	8.60	10.55	12.85
Weirton,W Va W6	5.45	7.65	8.60	10.55	12.85
Worcester,Mass A7	6.30	7.95	8.90	10.85	13.15
Worcester,Mass T6	6.10	7.95	8.90	10.85	13.15
Youngstown C8		7.65	8.60	10.55	12.85
Spring Steel (Tempered)					
Buffalo W12			12.50		
Bristol,Conn W1			12.50	15.00	
Franklin Park,Ill T6			13.25	15.75	18.75
Harrison,N J C18			12.50	15.00	18.00
New York W3			12.50	15.00	18.00
Trenton,N J R5			12.50	15.00	18.00
Worcester,Mass T6			12.50	15.00	18.00
Worcester,Mass W12			12.50		
Youngstown C8			*13.85*	*15.45*	*18.45*

SILICON STEEL

H.R. SHEETS (22 gage) (Cut Lengths)	Field	Armature	Electric	Motor	Dynamo
Beech Bottom,W Va W10			8.75	9.75	10.65
Brackenridge,Pa A4			8.75	9.75	10.65
Indiana Harbor,Ind I-2	7.85	8.15	8.75	9.75	
Mansfield,O E6	7.85	8.15	8.75	9.75	10.65
Newport,Ky N9	7.85	8.15	8.75	9.75	10.65
Niles,O N12	7.85	8.15	8.75	9.75	
Vandergrift,Pa U5		8.15	8.75	9.75	10.65
Warren,O R2	7.85	8.15	8.75	9.75	
Zanesville,O A10		8.15	8.75	9.75	10.65

C.R. COILS & CUT LENGTHS, (22 Ga.) Fully Processed (Semi processed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Granite City,Ill G4	8.25*	8.60*	9.20*	10.20*	
Indiana Harbor,Ind I-2	8.05	8.40*	9.00*		
Vandergrift,Pa U5	8.05*	8.90	9.50	10.50	11.40
Warren,O R2	8.05†	8.90	9.50	10.50	11.40

H.R. SHEETS (22 Gage) (Cut Lengths)	Transformer Grade T-72	T-65	T-58	T-52
Beech Bottom,W Va W10	11.60	12.15	12.65	13.65
Brackenridge,Pa A4	11.60			
Newport,Ky N9	11.60			
Vandergrift,Pa U5	11.60	12.15	12.65	13.65
Zanesville,O A10	11.60	12.15	12.65	13.65

C.R. COILS & CUT LENGTHS (22 Ga.)	T-100	T-90	T-80	T-73	T-72
Butler,Pa A10			16.25	16.75	
Vandergrift,Pa U5	13.65	14.65	16.25	16.75	12.35‡
Warren,O R2					12.35‡

* Semiprocessed. † Fully processed only. ‡ Coils annealed; semiprocessed ½c lower.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa J5	$7.40	$7.65	$8.05
Fairfield,Ala T2	7.50	7.75	8.15
Fairless,Pa U5	7.50	7.75	8.15
Gary,Ind U5	7.40	7.65	8.05
Granite City,Ill G4	7.60	7.85	8.25
Indiana Harbor,Ind I-2, Y1	7.40	7.65	8.05
Irvin,Pa U5	7.40	7.65	8.05
Niles,O R2	7.40	7.65	8.05
Pittsburg,Calif C11	8.15	8.40	8.80
Sparrows Point,Md B2	7.50	7.75	8.15
Weirton,W Va W6	7.40	7.65	8.05
Yorkville,O W10	7.40	7.65	8.05

TIN PLATE, American Cake (Base Box)	lb	1.25 lb	1.50 lb
Aliquippa,Pa J5	$8.70	$8.95	
Fairfield,Ala T2	8.80	9.05	
Fairless,Pa U5	8.80	9.05	
Gary,Ind U5	8.70	8.95	
Ind Har I-2, Y1	8.70	8.95	
Irvin,Pa U5	8.70	8.95	
Pitts Cal C11	9.45	9.70	
Sp Pt,Md B2	8.80	9.05	
Warren,O R2	8.70	8.95	
Weirton,W Va W6	8.70	8.95	
Yorkville,O W10	8.70	8.95	

BLACK PLATE (Base Box)	
Aliquippa,Pa J5	$6.50
Fairfield,Ala T2	6.60
Fairless,Pa U5	6.60
Gary,Ind U5	6.50
Granite City,Ill G4	6.70
Ind Harbor,Ind I-2, Y1	6.50
Irvin,Pa U5	6.50
Niles,O R2	6.50
Pittsburg,Calif C11	7.25
Sparrows Point,Md B2	6.60
Warren,O R2	6.50
Weirton,W Va W6	6.50
Yorkville,O W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)	
Follansbee,W Va F4	6.10
Gary,Ind U5	6.10
Granite City,Ill G4	6.30
Ind Harbor,Ind Y1	6.10
Irvin,Pa U5	6.10
Yorkville,O W10	6.10

MANUFACTURING TERNES (Special Coated)	
Fairfield,Ala T2	$7.85
Gary,Ind U5	7.75
Irvin,Pa U5	7.75
Yorkville,O W10	7.75

MANUFACTURING TERNES, 8 lb (Commercial Quality)	
Gary,Ind U5	$9.75
Yorkville,O W10	9.75

MANUFACTURING TERNES, LT Coated, 6 lb	
Yorkville,O W10	$8.65

ROOFING SHORT TERNES (8 lb Coated)	
Gary,Ind U5	9.75

WIRE

WIRE, Manufacturers Bright, Low Carbon	
Alabama City,Ala R2	5.525
Aliquippa,Pa J5	5.525
Alton,Ill L1	5.70
Atlanta A11	5.725
Bartonville,Ill K4	5.625
Buffalo W12	5.525
Chicago W13	5.525
Cleveland A7, C20, R2	5.525
Crawfordsville,Ind M8	5.625
Donora,Pa A7	5.525
Duluth,Minn A7	5.525
Fairfield,Ala T2	5.525
Fostoria,O (24) S1	5.75
Houston S5	5.925
Jacksonville,Fla M8	6.05
Johnstown,Pa B2	5.525
Joliet,Ill A7	5.525
Kansas City,Mo S5	6.125
Kokomo,Ind C16	5.625
Los Angeles B3	6.475
Minnequa,Colo C10	5.775
Monessen,Pa P7	5.575
No Tonawanda,N H1	5.525
Palmer,Mass W12	5.625
Pittsburg,Calif C11	6.175
Portsmouth,O P12	5.525
Rankin,Pa A7	5.525
So Chicago,Ill R2	5.525
So San Francisco C10	6.475
Sparrows Point,Md B2	5.625
Sterling,Ill (1) N15	5.525
Struthers,O Y1	5.525
Waukegan,Ill A7	5.525
Worcester,Mass A7	5.825

WIRE, MB Spring, High Carbon	
Aliquippa,Pa J5	6.925
Alton,Ill L1	7.10
Bartonville,Ill K4	7.025
Buffalo W12	6.925
Cleveland A7	6.925
Donora,Pa A7	6.925
Duluth,Minn A7	6.925
Fostoria,O S1	6.925
Johnstown,Pa B2	6.925
Los Angeles B3	7.875
Millbury,Mass (12)	N6 7.225
Minnequa,Colo C10	7.175
Monessen,Pa P7, P16	6.925
Muncie,Ind I-7	7.125
Palmer,Mass W12	7.225
Pittsburg,Calif C11	7.875
Portsmouth,O P12	6.925
Roebling,N J R5	7.225
So Chicago,Ill R2	6.925
So San Fran,Calif C10	7.875
Sparrows Pt.,Md B2	7.025
Struthers,O Y1	6.925
Trenton,N J A7	7.225
Waukegan,Ill A7	6.925
Worcester A7, J4	7.225
Worcester T6, W12	7.225

WIRE, Upholstery Spring	
Aliquippa,Pa J5	6.625
Alton,Ill L1	6.80
Buffalo W12	6.625
Cleveland A7	6.625
Donora,Pa A7	6.625
Duluth,Minn A7	6.625
Johnstown,Pa B2	6.625
Los Angeles B3	7.575
Minnequa,Colo C10	6.80
Monessen,Pa P7, P16	6.625
New Haven,Conn A7	6.925
Palmer,Mass W12	6.925
Pittsburg,Calif C11	7.575
Portsmouth,O P12	6.625
Roebling,N J R5	6.925
So Chicago,Ill R2	6.625
So San Francisco C10	7.575
Sparrows Point,Md B2	6.725
Trenton,N J A7	6.925
Waukegan,Ill A7	6.625
Worcester,Mass A7	6.925

WIRE, Fine & Weaving(8 Coils)	
Alton,Ill L1	10.75
Bartonville,Ill K4	10.65
Buffalo W12	10.55
Chicago W13	10.55
Cleveland A7	10.55
Crawfordsville,Ind M8	10.65
Fostoria,O S1	10.55
Jacksonville,Fla M8	11.08
Johnstown,Pa B2	10.55
Kokomo,Ind C16	10.55
Minnequa,Colo C10	10.50
Monessen,Pa P16	10.55
Muncie,Ind I-7	10.75
Palmer,Mass W12	10.85
Roebling,N J R5	10.85
So San Francisco C10	10.90
Waukegan,Ill A7	10.55
Worcester,Mass A7,T6	10.85

WIRE, Galv'd ACSR for Cores	
Bartonville,Ill K4	9.50
Buffalo W12	9.50
Johnstown,Pa B2	9.50
Minnequa,Colo C10	9.625
Monessen,Pa P16	9.50
Muncie,Ind I-7	9.70
Portsmouth,O D2	9.50
Roebling,N J R5	9.80
Sparrows Pt.,Md B2	9.60

ROPE WIRE	(A)
Alton,Ill L1	9.45
Bartonville,Ill K4	9.35
Buffalo W12	9.35
Fostoria,O S1	9.35
Johnstown,Pa B2	9.35
Monessen,Pa P7, P16	9.35
Muncie,Ind I-7	9.55
Palmer,Mass W12	9.65
Portsmouth,O P12	9.35
Roebling,N J R5	9.65
Sparrows Pt. B2	9.45
Struthers,O Y1	9.35
Worcester J4, T6	9.65

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Tire Bead	
Alton,Ill L1	12.75
Bartonville,Ill K4	12.65
Monessen,Pa P16	12.55
Roebling,N J R5	12.85

WIRE, Cold-Rolled Flat	
Anderson,Ind G6	7.45
Buffalo W12	7.45
Cleveland A7	7.45
Crawfordsville,Ind M8	7.55
Dover,O G6	7.45
Fostoria,O S1	7.45
Kokomo,Ind C16	7.55
Franklin Park,Ill T6	7.60
Massillon,O R8	7.45
Monessen,Pa P7, P16	7.45
Pawtkt.,R I (12) N8	7.75
Trenton,N J R5	7.75
Worcester A7, T6, W12	7.75

WIRE, Merchant Quality (6 to 8 gage)	An'ld.	Galv.
Ala City,Ala R2	6.675	7.075**
Aliquippa,Pa J5	6.675	7.20*
Atlanta A11	6.775	7.30
Bartonville(48) K4	6.775	7.275
Buffalo W12	6.675	7.075†
Cleveland A7	6.675	
Crawfordsville,Ind M8	6.775	7.30
Donora,Pa A7	6.675	7.075†
Duluth,Minn A7	6.675	7.075†
Fairfield T2	6.675	7.075†
Houston,Tex S5	7.075	7.475
Jacksonville,Fla M8	7.20	7.73
Johnstown B2 (48)	6.675	7.225*
Joliet,Ill A7	6.675	7.075†
Kansas City,Mo S5	7.275	7.675
Kokomo C16	6.775	7.175†
Los Angeles B3	7.625	
Minnequa C10	6.925	7.325**
Monessen P7 (48)	6.675	7.225
Palmer W12	6.975	7.375†
Pitts.,Calif. C11	7.625	8.025†
Portsmouth,O P12	6.675	
Rankin A7	6.675	7.075†
So Chi'go R2	6.675	7.075**
S S Fr'n (48)	C10 7.625	8.025**
Sparrows Pt. B2 (48)	6.775	7.325*
Sterling (1) (48)	N15 6.675	7.20
Struthers,O Y1	6.675	7.175
Worcester A7	6.975	

* Based on 10c zinc; † 5c zinc; ** Subject to zinc equalization extras.

WOVEN FENCE, 9-15½ Ga.	Col.
Ala City,Ala R2	140**
Ala City, 17 ga. R2	235**
Ala City, 18 ga. R2	245**
Aliq'pa,Pa 9-14½ ga. J5	143*
Atlanta A11	145
Bartonville,Ill. K4	144
Crawfordsville,Ind. M8	145
Donora,Pa. A7	140†
Duluth,Minn. A7	140†
Fairfield,Ala. T2	140†
Houston,Tex. S5	148
Johnstown,Pa. B2	143
Johnstown 17 ga., 6" B2	234
Johnstown 4" B2	237
Joliet,Ill. A7	140†
Kansas City,Mo. S5	152
Kokomo,Ind. C16	142†
Minnequa,Colo. C10	148**
Monessen,Pa. 9 ga. P7	145
Pittsburg,Calif. C11	163†
Rankin,Pa. A7	140†
So. Chicago,Ill. R2	140**
Sterling,Ill. (1) N15	*143*

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

BALE TIES, Single Loop	Col.
Alabama City,Ala, R2	149
Atlanta A11	151
Bartonville,Ill. K4	151
Crawfordsville,Ind. M8	151
Donora,Pa. A7	149
Duluth,Minn. A7	149
Fairfield,Ala. T2	149
Joliet,Ill. A7	149
Kansas City,Mo. S5	161
Kokomo,Ind. C16	151
Minnequa,Colo. C10	154
Pittsburg,Calif. C11	173
So. Chicago,Ill. R2	149
So. San Fran.,Calif. C10	173
Sparrows Point,Md. B2	151
Sterling,Ill. (1) N15	149

WIRE, Barbed	Col.
Alabama City R2	153**
Aliquippa J5	150*
Atlanta A11	158
Bartonville,Ill. K4	157
Crawfordsville,Ind. M8	158
Donora,Pa. A7	153†
Duluth,Minn. A7	153†
Fairfield,Ala. T2	153†
Houston,Tex. S5	161
Johnstown,Pa. B2	156*
Joliet,Ill. A7	153†
Kansas City,Mo. S5	165
Kokomo,Ind. C16	155†
Minnequa,Colo. C10	159**
Monessen,Pa. P7	157
Pittsburg,Calif. C11	173†
Rankin,Pa. A7	153†
So. Chicago,Ill. R2	153**
S. San Francisco C10	176**
Sparrows Point,Md. B2	158*
Sterling,Ill. (1) N15	*156*

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

WIRE (16 gage)	An'ld. "Stone	Galv. Stone
Ala City R2	12.50	14.05**
Aliquippa J5	12.50	14.30*
Bartonville K4	12.60	14.35
Buffalo W12	12.50	
Cleveland A7	12.50	
Crawfordsville M8	12.50	14.30
Fostoria,O S1	12.60	14.15
Johnstown B2	12.50	14.35*
Kokomo C16	12.60	14.15†
Minnequa C10	12.75	14.45**
Palmer,Mass W12	12.50	14.05†
Pitts.,Calif. C11	12.85	14.40†
Sparrows Pt. B2	12.60	14.45*
Sterling (1) N15	12.50	14.30
Waukegan A7	12.50	14.05†
Worcester A7	12.50	

* Based on 11c zinc; † 5c zinc; ** Subject to zinc equalization extras.

NAILS, Stock To dealers & mfrs. (7)	Col.
Alabama City,Ala. R2	131
Aliquippa,Pa. J5	131
Atlanta A11	133
Bartonville,Ill. K4	133
Chicago,Ill. W13	131
Cleveland A9	137
Crawfordsville,Ind. M8	133
Donora,Pa. A7	131
Duluth,Minn. A7	131
Fairfield,Ala. T2	131
Galveston,Tex. D7	139
Houston,Tex. S5	139
Johnstown,Pa. B2	131
Joliet,Ill. A7	131
Kansas City,Mo. S5	143
Kokomo,Ind. C16	133
Minnequa,Colo. C10	136
Monessen,Pa. P7	131
Pittsburg,Calif. C11	150
Rankin,Pa. A7	131
So. Chicago,Ill. R2	131
Sparrows Pt.,Md. B2	133
Sterling,Ill. (1) N15	131
Worcester,Mass. A7	137

NAILS, CUT (100 lb keg) To dealers (33)	
Conshohocken,Pa. A3	$8.00
Wheeling,W.Va. W10	8.00

STAPLES, Polished Stock To dealers & mfrs. (7)	Col.
Alabama City,Ala. R2	133
Aliquippa,Pa. J5	133
Atlanta A11	135
Bartonville,Ill. K4	135
Crawfordsville,Ind. M8	135
Donora,Pa. A7	133
Duluth,Minn. A7	133
Fairfield,Ala. T2	133
Johnstown,Pa. B2	133
Joliet,Ill. A7	133
Kokomo,Ind. C16	135
Minnequa,Colo. C10	138
Monessen,Pa. P7	133
Pittsburg,Calif. C11	152
Rankin,Pa. A7	133
So. Chicago,Ill. R2	133
Sparrows Pt.,Md. B2	135
Sterling,Ill. (1) N15	133
Worcester,Mass. A7	139

FENCE POSTS

	Col.
Chicago Hts.,Ill. C2, I-2	145
Duluth,Minn. A7 (49)	145
Franklin,Pa. F5	145
Johnstown,Pa. B2	145
Marion,O. P11	145
Minnequa,Colo. C10	150
Moline,Ill. R2	145
So. Chicago,Ill. R2	145
Tonawanda,N.Y. B12	145
Williamsport,Pa. S19	148

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	½		¾		1		1¼		1½		2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92											
Pounds Per Ft	0.85		1.13		1.68		2.28		2.73		3.68		5.82		7.62		9.20		10.89		14.81		18.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	24	5.75	25.5	8.25
Ambridge, Pa. N2 (†)	15.75	"	19.75	"	22.25	"	23.75	"	23.75	"	24	"	25.5	"
Lorain, O. N3 (*)	15.75	4.5	19.75	5.5	22.25	8	23.75	9.5	23.75	9.5	24	8.75	25.5	11.25
Youngstown Y1 (††)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	24	5.75	25.5	8.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2 (**)	15.75	1.5	19.75	3.5	22.25	6.0	23.75	7.5	23.75	7.5	23	7.5	25.5	6.75

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼		1½	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c		27.5c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28		2.73	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)							26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Alton, Ill. L1 ($)							24.25	9	27.25	13	29.75	16.5	32.25	17.5	32.75	18.25
Benwood, W. Va. W10(††)	25.5	+0.25	17.75	+5.5	10.25	+10	26.25	11	29.25	15	31.75	18.5	34.25	19.5	34.75	20.25
Butler, Pa. F6	26.5	−1.75	19.5	+2.75	12.5	+6.25										
Etna, Pa. N2 (†)							26.25	7	29.25	11	31.75	14.5	34.25	16.25	34.75	17.25
Fairless, Pa. N3							24.25		27.25		29.75		32.25		32.75	
Fontana, Calif. K1 ($)							13.25	+3	16.25	1	18.75	4.5	21.25	5.5	21.75	6.5
Ind. Harbor Y1 (††)							25.25	9	28.25	13	30.75	16.5	33.25	17.5	34.75	18.5
Lorain, O. N3 (*)							26.25	16	29.25	20	31.75	23.5	34.25	23	34.75	24
Sharon, Pa. S4 (‡)	26.5	−0.25	19.50	+4.25	12.5	+8.5										
Sharon, Pa. M6							26.25	11	29.25	15	31.75	18.5	34.25	19.25	34.75	20.25
Sparrows Pt., Md. B2 ($)	24.5	+1.75	17.5	+6.25	10.5	+10.5	24.25	8	27.25	12	29.75	15.5	32.25	16.5	32.75	17.5
Youngstown R2 (**)							26.25	12	29.25	16	31.75	19.5	34.25	20.0	34.75	21.0
Youngstown Y1 (††)							26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Wheatland, Pa. W9 (‡)	24.5	+1.75	17.5	+6.25	10.5	+10.5	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5

Size—Inches	2		2½		3		3½		4	
List Per Ft	37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	35.25	20	36.75	20	36.75	20				
Alton, Ill. L1 ($)	33.25	18.75	34.75	18	34.75	18				
Benwood, W. Va. W10(††)	35.25	20.75	36.75	20.5	36.75	20.5	27.75	11	27.75	11
Etna, Pa. N2 (†)	35.25	17.25	36.75	18.5	36.75	18.5	27.75	9	27.75	9
Fairless, Pa. N3	33.25		34.75		34.75		25.75		25.75	
Fontana, Calif. K1 (‡)	22.25	7	23.75	7	23.75	7				
Ind. Harbor, Ind. Y1 (††)	34.25	19	35.75	19	35.75	19				
Lorain, O. N3 (*)	35.25	24.5	36.75	23	36.75	23				
Sharon, Pa. M6	35.25	20.75	36.75	20.5	36.75	20.5				
Sparrows Pt., Md. B2 ($)	32.25	18	34.75	18	34.75	18	25.75	8.5	25.75	8.5
Youngstown R2 (**)	35.25	21.5	36.75	21.0	36.75	21.0	27.75	11.5	27.75	11.5
Youngstown Y1 (††)	35.25	20	36.75	20	36.75	20				
Wheatland, Pa. W9 (‡)	35.25	20	36.75	20	36.75	20				

Galvanized pipe discounts based on zinc price of: (‡), 14c; (†), 11c to under 12c; (*), 5c; ($), 10c to under 11c; (††), 10.50c-11.50c; (**), 9.50c; with discounts adjusted on price of zinc at time of shipment.

BOILER TUBES

Net base c.l. prices, dollar per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W.G. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13		19.62	18.44
1¼	13		22.53	21.12
1½	13	20.65	24.93	20.61
1¾	13	24.40	29.43	23.66
2	13	27.34	32.98	26.51
2¼	13	30.80	37.15	29.86
2½	12	33.43	40.32	32.41
2¾	12	36.82	44.41	35.70
2¾	12	39.87	48.09	38.66
3	12	42.52	51.28	41.23

RAILWAY MATERIALS

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	4.325	4.225	4.275	5.20
Ensley,Ala. T2	4.325	4.225		5.20
Fairfield,Ala. T2				5.20
Gary,Ind. U5	4.325	4.225	4.275	
Huntington,W.Va. W7				5.20
IndianaHarbor,Ind. I-2	4.325	4.225	4.275	
Johnstown,Pa. B2				(16)5.20
Lackawanna,N.Y. B2	4.325	4.225		5.20
Minnequa,Colo. C10	4.325	4.125		5.20
Steelton,Pa. B2	4.325	4.225		
Williamsport,Pa. S10				5.20

TIE PLATES	
Fairfield,Ala. T2	5.125
Gary,Ind. U5	5.125
Ind.Harbor,Ind. I-2	5.125
Lackawanna,N.Y. B2	5.125
Minnequa,Colo. C10	5.125
Pittsburg,Calif. C11	5.275
Seattle B3	5.275
Steelton,Pa. B2	5.125
Torrance,Calif. C11	5.275

TRACK BOLTS (20) Treated	
Cleveland R2	11.00
KansasCity, Mo. S6	11.00
Lebanon,Pa. B2	11.00
Minnequa,Colo. C10	11.00
Pittsburgh O3, P14	11.00
Seattle,Wash. B3	11.50

JOINT BARS	
Bessemer,Pa. U5	5.275
Fairfield,Ala. T2	5.275
Ind.Harbor,Ind. I-2	5.275
Joliet,Ill. U5	5.275
Lackawanna,N.Y. B2	5.275
Minnequa,Colo. C10	5.275
Steelton,Pa. B2	5.275

AXLES	
Ind.Harbor,Ind. S13	6.50
Johnstown,Pa. B2	6.50

STANDARD TRACK SPIKES	
Fairfield,Ala. T2	7.60
Ind.Harbor,Ind. I-2, Y1	7.60
KansasCity,Mo. S6	7.50
Lebanon,Pa. B2	7.60
Minnequa,Colo. C10	7.60
Pittsburgh,Pa.	7.60
Seattle B3	7.60
So.Chicago,Ill. R2	7.60
Struthers,O. Y1	7.60
Youngstown R2	7.60

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 5.50c
⅝-in. under ..... 26.5 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

6 in. and shorter	
½-in. & smaller diam.	4
⅝-in. & ¾-in.	5
⅞-in. and larger	3
Longer than 6 in.	
All diams.	+4
Lag bolts, all diams.	
6 in. and shorter	12
Over 6 in. long	8
Ribbed Necked Carriage	5
Blank	25
Plow	25
Step, Elevator, Tap and Sleigh Shoe	12
Tire Bolts	List
Boiler & Fitting Up Bolts	25

NUTS

H.P. & C.P., regular & heavy	
Square, all sizes	5
H.P. Hex, regular & heavy	
⅝" and smaller	5
⅝" to 1⅛", inclusive	6
1¼" to 1½", inclusive	6
1⅝" and larger	5
C.P. Hex, regular heavy	
All sizes	5
Hot Galv. Nuts (all types)	
⅝" and smaller	+4
⅝" to 1½", inclusive	4
Finished Hex Nuts	
New standard, all sizes	5
Semifinished & Slotted Hex	
Regular and heavy, all sizes	5

SQUARE HEAD SET SCREWS

(Packaged, per cent off list)

1 in. diam. x 6 in. and shorter	31
1 in. and smaller diam. x over 6 in.	20

HEADLESS SET SCREWS

(Packaged, per cent off list)

No. 10 and smaller	31
¼ in. diam. & larger	11
N.F. thread, all diams.	5

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	17.5 & 10
Plated finishes	20 & 10

HEXAGON CAP SCREWS

(1020 steel, packaged, per cent off list)

6 in. or shorter	
⅜ in. & smaller	25
½ in. through 1 in.	22
Longer than 6 in.	
⅜ in. and smaller	20
½ in. through 1 in.	7

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

Sponge Iron	Cents
Swed.-C. Fe, annealed	18.00
Unannealed	
Minus 100 mesh	14.50
Minus 325 mesh	19.50
Minus 20 mesh	10.00
Swedish, c.l., N.Y.	
c.l., in bags	11.25
Domestic (Swedish), f.o.b. Riverton, N.J., in bags	11.25
Electrolytic iron:	
Melting stock, 99.91% Fe, irregular fragments of ⅛ in. x 1.3 in.	23.00
Annealed, 99.5% Fe	42.50
Unannealed (99+ % Fe)	36.50
Unannealed (99+ % Fe, minus 325 mesh)	53.50
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron:	
97.9-99.8% size 5-to-10 microns	83.00-148.00
Aluminum:	
Atomized, 500 lb drums, freight allowed:	
Carlots	31.00
Ton lots	34.00
Antimony, 500 lb lots	32.00*
Brass, ¼ ton lots	28.75-37.50†
Bronze, ¼ ton lots	50.00-60.00†
Copper:	
Electrolytic	13.50*
Reduced	13.50*
Lead	7.50*
Magnesium	54.00-56.00
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel, unannealed	99.50
Nickel-Silver, ¼ ton lots	44.00-49.00§
Nickel-Silver, ¼ ton lots	46.75**
Phosphor Bronze, ¼ ton lots	58.50
Silicon	13.50
Solder	8.50*
Stainless Steel, 302	91.00
Tin	14.50*
Zinc, ¼ ton lots	15.00-28.75†
Tungsten	¢ Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	4.95
Less than 1000 lb	5.10
Chromium, electrolytic 99.9% Cr, min	3.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 29% Zn, 1% Sn. **64% Cu, 18% Zn, 18% Ni.

Footnotes

(1) Chicago base.
(2) Angles, flat, bands 4c.
(3) Merchant.
(4) Spotmore:
(a) 1¾" to 2 7/16", 1.7-16" to 1.15/16", 4.50c; 1.15/16" to 2.5/16", 4.50c.
(b) Chicago or Birm. base.
(c) To jobbers, 2 cols. lower.
(d) 16 gage and heavier.
(e) 6 in. and narrower.
(f) Pittsburgh base.
(g) Cleveland & Pitts. base.
(h) Worcester, Mass. base.
(i) Add 0.25c for 17 Ga. & heavier.
(j) Gage 0.141 to 0.249 in.; for gage 0.142 and lighter, 5.50c.
(k) ⅝" and thinner.
(l) ⅜" and thinner.
(m) 10 lb and under.
(n) Flats only, 0.25 in. & heavier.
(o) Tin-dealers.
(p) Chicago & Pitts. base.
(q) 0.25c off for untreated.
(r) New Haven, Conn. base.
(s) Del. San Francisco Bay area.
(t) 20 Ga. 36" wide.
(u) Deduct 0.10c, finer than 15 Ga.
(v) Bar mill bands.
(w) Reinforcing mill lengths; to fabricators, to consumers, 5.40c.
(x) Bar mill size.
(y) Bonderized.
(z) Youngstown base.
(aa) Sheared; for universal mill add 0.45c for carbon and 0.55c for H.S.L.A.
(bb) Base, deld. within mill area.
(cc) Buffalo base.
(dd) To jobbers, deduct 20c.
(ee) 9.60c for cut lengths.
(ff) 72" and narrower.
(gg) 54" and narrower.
(hh) 13 gage & lighter, 60" & narrower.
(ii) 14 gage & lighter, 48" and narrower.
(jj) 18 gage & lighter, 48" and narrower.
(kk) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(ll) 9.10c for cut lengths.
(mm) 6.7 gage.
(nn) T post; deduct 2 cols for U post.

STAINLESS STEEL MILL PRICES

(Representative prices, cents per pound, subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes, H R & C F H R Strip	Bars, Wire	Plates	Sheets	C R Strip, Flat Wire
301	16.25	20.50	25.50	34.25	29.25	30.25	37.25	46.25	35.25
302	17.25	22.75	28.75	34.50	32.00	33.50	37.50	46.50	41.50
302B	18.50	24.00	30.00	34.50	33.00	34.50	37.50	45.75	41.75
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75	48.75	45.00
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75	48.75	43.75
304L			30.75			42.25	43.25	54.25	49.00
305	19.00	25.00		36.25	37.00	37.50	42.00	51.75	46.75
308	19.75	26.25	33.25	40.75	38.00	42.00	46.00	55.25	48.00
309	26.00	34.75	43.25	49.25	49.25	50.50	53.75	65.00	62.00
309S	25.00	32.00	42.00	48.00	48.00	49.50	52.00	63.50	60.50
310	33.00	43.25	56.75	66.25	65.50	67.50	69.00	72.25	78.75
314							69.00	74.00	
316	25.00	36.25	46.75	48.50	55.00	53.50	59.00	64.50	66.50
316L			42.50			61.00	64.25	70.00	72.00
317	33.00	33.00	45.25	56.75	67.50	65.25	70.75	77.00	79.25
321	33.50	44.00	60.25	64.50	66.25	65.50	65.75	78.00	80.25
321	22.75	29.50	42.25	49.75	42.00	42.00	46.00	55.00	54.50
330			47.00			65.50	70.00	73.75	77.75
347	24.50	32.25	39.50	44.75	46.50	46.75	51.25	60.75	59.25
403			27.00	30.75		32.00	34.25	44.00	41.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	42.50	39.75
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	40.75	34.25
416			24.50	28.25		29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	33.50	35.00	38.50	49.25	42.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	43.50	34.75
430F		18.75	25.00	28.75		29.75	31.00	44.00	44.00
431	14.50	28.50	25.00	28.25	27.50	29.25	30.50	44.00	35.25
440A B C		28.50	29.25	34.00		35.00	38.50	49.25	42.75
442			28.00			30.50	35.25	48.25	47.75
446			33.75	38.25	43.00	39.50	40.75	50.75	47.00
501			14.00	14.50	21.25	16.00	18.25	29.50	25.00
502			15.25	16.00	22.25	17.00	20.00	31.75	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co., Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson, Inc.; Carpenter Steel Co.; Chatter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National Standard Co.; National Tube Co.; P. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Shenango Ajax Tube Co.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Fred Ulbrich & Sons; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

CLAD STEEL

Cladding Stainless	Plates, Carbon Base 10%	Plates, Carbon Base 20%	Sheets, Carbon Base 20%	Sheets, Copper Base Both Sides
302		31.00	31.00	77.00
304	27.50	32.50-32.75	32.50	77.00
310	36.50	41.00		144.00
316	32.60	37.70-42.75	42.75	
318	37.00	42.20		
321	29.30	34.40-37.00	37.00	111.00
347	30.40	34.50-40.50	40.50	130.00
405	23.40	30.60		
410	22.50	30.10		
430	22.90	30.10		
Inconel	41.23	46.18		166.00
Nickel	37.50	40.50		
Monel	38.90	44.80		
Copper			46.00	

Cladding Stainless	Strip, Carbon Base, Cold-Rolled 10%	Strip, Carbon Base, Cold-Rolled Both Sides	Strip, Carbon Base, Hot-Rolled 10%	Strip, Carbon Base, Hot-Rolled Both Sides
Copper			46.00	

Deoxidized. Production points: Stainless sheets, New Castle, Ind. 14 stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J5; nickel, monel, monel-clad plates, Coatesville, L7, copper-clad strip, Carnegie, Pa. S15. Production point for copper-base sheets is Carnegie, Pa. A13.

TOOL STEEL

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.25	5% Cr Hot Work	0.38
Extra Carbon	0.30	W-Cr Hot Work	0.41
Special Carbon	0.35+	V-Cr Hot Work	0.42-.43
Oil Hardening	0.37-.390	Hi-Carbon-Cr	0.665-.70

W	Cr	V	Co	Mo	$ per lb
20	4	1.5	12		3.875
18	4	1	14.5		2.160-2.320
18	4	2	5		2.415
18	4	2			1.840
18	4	1			1.490
9	4	1			1.735
13.5	4	3			1.665-1.960
6.4	4	1.9		5	1.665-1.960
6	4	3		6	1.240
2	1.4	1.2			0.695
1.5	4	1		8.5	0.855-0.895

Grade by Analysis (%)

Tool Steel producers include: A4, A5, B2, B5, C4, C9, C13, C18, D1, F2, J3, L3, M10, S8, U4, V2 and V3.

PIG IRON

Gross Ton

Each furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
Alabama City, R2	52.38	52.88		
Birmingham, R2	52.38	52.88		
Birmingham, U6		52.88		
Woodward, Ala., W1	52.38	52.88	56.50	
Cincinnati, del		60.43		
Buffalo District				
Buffalo, R2, H1	56.00	56.50	57.00	
Tonawanda, N.Y., W12	56.00	56.50	57.00	
So. Tonawanda, N.Y., T9		56.50	57.00	
Boston, del	66.61	67.13	67.63	
Rochester, N.Y., del	59.02	59.52	60.02	
Syracuse, N.Y., del	60.12	60.62	61.12	
Chicago District				
Chicago, I-3	56.00	56.50	56.50	57.00
Gary, Ind., U5	56.00		56.50	
Indiana Harbor, Ind., I-2	56.00		56.50	
So. Chicago, Ill., W11, Y1	56.00	56.50	56.50	
So. Chicago, Ill., U5	56.00		56.50	57.00
Milwaukee, del	58.17	58.67	58.67	59.17
Muskegon, Mich., del		62.80	62.80	
Cleveland District				
Cleveland, A7	56.00	56.50	56.50	57.00
Cleveland, R2	56.00	56.50	56.50	
Akron, O., del. from Cleve.	58.45	58.95	58.95	59.45
Lorain, O., N1	56.00			57.00
Mid Atlantic District				
Bethlehem, Pa., B2	58.00	58.50	59.00	59.50
New York, del		62.58	62.58	
Newark, del	61.02	61.52	62.02	62.52
Bridgeport, Pa., B10	58.00	58.50		
Steelton, Pa., B2	58.00	58.50	59.00	59.50
Swedeland, Pa., A7	58.00	58.50	59.00	59.50
Philadelphia, del	59.66	60.16	60.66	61.16
Troy, N.Y., R2	58.00	58.50	59.00	
Pittsburgh District				
Neville Island, Pa., P6	56.00	56.50	56.50	57.00
Pittsburgh, N&S sides, Ambridge		56.50	56.50	
Aliquippa, del	57.32	57.82	57.82	58.32
McKees Rocks, del	57.01	57.51	57.51	58.01
Lawrenceville, Homestead		56.50	56.50	
Wilmerding, Monaca, del	57.66	58.16	58.16	58.66
Verona, Trafford, del	58.10	58.60	58.60	59.10
Brackenridge, del	58.45	58.95	58.95	59.45
Bessemer, Pa., U5	56.00		56.50	57.00
Clairton, Rankin, So. Duquesne, Pa., U5	56.00			
McKeesport, Pa., N3	56.00			57.00
Midland, Pa., C15	56.00			
Monessen, Pa., P7	56.00			
Youngstown District				
Hubbard, O., Y1			56.50	
Sharpsville, Pa., S6	56.00	56.50	56.50	57.00
Youngstown, Y1			56.50	57.00
Youngstown, U5	56.00			57.00
Mansfield, O., del	60.90		61.40	61.90
Duluth, I-3	56.00	56.50	56.50	57.00
Erie, Pa., I-3	56.00	56.50	56.50	57.00
Everett, Mass., E1	62.50	63.25	63.50	
Fontana, Calif., K1	62.00	62.50		
Geneva, Utah, C11	56.00	56.50		
Granite City, Ill., G4	57.50	58.40	58.90	
Ironton, Utah, C11	56.00	56.50		
Lone Star, Texas, L6	52.00	52.50	52.50	
Minnequa, Colo., C10	56.00	56.00	56.00	
Rockwood, Tenn., T3			56.50	
Toledo, O., I-3	56.00	56.50	56.50	57.00
Cincinnati, del	61.76	62.26		

Low phos, southern grade. Phos 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.40%, no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.01-6.50% silicon; add $1.50 for each 0.5% Si; 7½ cents for each 0.5% Mn over 1%.)

Jackson, O., G2, J1	$67.00
Buffalo, H1	68.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.45 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.04% max P.)

Niagara Falls, N.Y., P15	$87.50
Keokuk, Iowa, Openhearth & Fdry., freight allowed K2	92.00
Keokuk, OH & Fdry., 12% Si pigiets, bulk, freight allowed K2	93.00
Wenatchee, Wash., OH & Fdry., freight allowed K2	92.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$61.00
Rockwood, Tenn., T3	70.00
Steelton, Pa., B2	64.00
Philadelphia, del	64.00
Troy, N.Y., R2	64.00

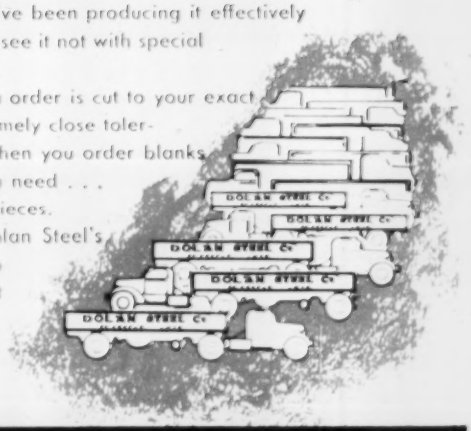
DOLAN STEEL gives you..... 3d imension accuracy

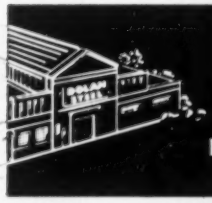
width • length • gauge

There's nothing new about 3-D at Dolan Steel—we've been producing it effectively for years. But here it means only one thing, and you see it not with special glasses, but with an accurate rule and micrometer.

Every coil of strip steel . . . every blank or strip you order is cut to your exact specifications — accurate in every dimension. Extremely close tolerances *actually give you more parts per ton*. And when you order blanks or strips, Dolan shears them to exactly the size you need . . . no scrap loss from cutting up large standard size pieces.

If you need strip steel, now, in coils or blanks, Dolan Steel's fleet of 15 fast, modern trailer trucks are ready to serve you. Call us today and let us prove to you that our policy of providing fast service is not just words . . . but action!





DOLAN Steel Company Inc.

810 UNION AVE BRIDGEPORT 7, CONN

PHONE 5-8173

NEW ENGLAND'S LARGEST STEEL WAREHOUSE, FLAT ROLLED STEEL, EXCLUSIVELY, SERVING NEW ENGLAND, NEW YORK AND NEW JERSEY

WAREHOUSE STEEL PRODUCTS

(Cents per 100 lb except as noted, subject to extras; f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 50 cents; Philadelphia, 25 cents; Birmingham, Erie, St. Paul, 15 cents; Seattle and Spokane, Wash., no charge.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††		Carbon	Floor
Boston	6.20	7.61	7.75	7.00		6.86	8.17*	12.04	6.98	6.85	7.98
Birmingham	6.20	7.60	8.00	6.36		6.15	8.50		6.35	6.35	8.25
Boston	6.85	7.82	9.18	7.13		6.87	8.35	12.13	7.06	7.13	8.26
Buffalo	6.15	7.15	8.70	6.75		6.35	7.70	12.02	6.59	6.68	7.88
Chattanooga	6.30	7.40	8.65	6.80		7.10	8.37		7.10	7.10	8.37
Chicago	6.15	7.42	7.95	6.42‡		6.28*	7.30	11.60	6.46	6.53	7.46
Cincinnati	6.30	7.41	8.00	6.66		6.52	7.60	11.85	6.64	6.62	7.71
Cleveland	6.15	7.42	7.90	6.58		6.34	7.40	11.74	6.79	6.59	7.63
Detroit	6.25	7.50	8.22	6.69	7.36	6.56	7.60	11.97	6.91	6.80	7.80
Erie, Pa.	6.15		8.15	6.75		6.23	7.50*		6.50	6.36	7.79
Houston	7.15	7.50	9.25	7.45	9.30	7.45	9.30		7.35	7.20	8.55
Los Angeles	7.25	7.60	9.35	7.55	11.20	7.15	9.10	13.10	7.35	7.20	9.25
Milwaukee	6.35	7.29	8.12	6.59		6.35	7.57	11.77	6.63	6.56	7.63
Mobile, Ala.	6.85	7.45	8.35	6.77		6.63	7.65		6.81	6.68	
New York	6.25	7.52	8.27	7.18		7.06	8.43*	11.99	6.80	6.99	8.30
Seattle, Wash.	6.50			7.00		7.00	8.50		7.00	7.00	7.85
Philadelphia	6.34	7.13	7.87	7.02	8.50	6.87	8.19*	11.74	6.67	6.63	7.66**
Pittsburgh	6.18	7.12	8.00	6.55		6.28	7.65	11.60	6.46	6.33	7.46
Portland, Oreg.	7.90	8.45	9.15	7.65		7.35	10.65		7.25	7.30	9.15
Richmond, Va.	6.50		8.67	7.10		7.05	8.20		7.10	6.85	8.20
St. Louis	6.45	7.42	8.25	6.72		6.58	7.70	11.90	6.86	6.73	7.86
St. Paul	6.81	7.78	8.66	7.08		6.94	8.06		7.12	6.99	8.12
San Francisco	7.35	8.20	9.30	7.60		7.15	9.75	12.90	7.25	7.20	9.25
Seattle	8.15	9.50	9.80	8.00		7.60	10.65	13.50	7.50	7.60	9.40
Spokane	8.15†	9.50	9.80	7.60		7.60	10.55*	14.15	7.25	7.35	9.40
Washington	6.71	7.65	8.35	7.51		7.37	8.43		7.49	7.36	8.49

*Prices do not include gage extras. †Prices include gage and coating extras except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded). ‡Includes 25-cent special bar quality extra. §As rolled. **¾ in. and heavier, add 0.3¢ for 12 gage and lighter. ††As annealed. Base quantities: 2000 to 9999 lb except as noted. Cold-rolled strip and cold-finished bars, 2000 lb and over, except in Seattle where base is 2000 to 9999 lb. †† 500 to 9999 lb. * 1000 to 1999 lb. * 1000 lb and over. ‡‡1500 lb to 2999. * Under ½ in.

Distributor Adopts New Pricing Policy

Delivered prices are established by Brown-Wales Co. for every county and consuming point in New England states, excepting Connecticut. New policy stabilizes costs to users

Boston New pricing policy initiated by Brown-Wales Co., with warehouses at Cambridge, Lewiston-Auburn, Me., and Hartford, Conn., in effect stabilizing delivered costs uniformly to consumers is being followed generally by distributors.

Based on the lowest truck rate from nearest competing warehouse, area delivered prices are readily established for every county and consuming point in all New England states, Connecticut excepted.

Boston, Worcester, Springfield, Providence, Portland, Me., and Nashua, N. H. are among points designated as metropolitan delivery areas with base prices for 2000-pound shipments; country price is 20 cents less per 100 pounds for all products. Delivery to Fitchburg, Mass., for instance, is figured on the Worcester metropolitan base; Holyoke, Mass., on Springfield and Mansfield, Mass., on metropolitan Providence.

Establishment of delivered prices on minimum truck rates from nearest warehouse area is the important stabilizing factor.

Pittsburgh With stocks in balance warehouses are prepared for any upswing in orders second quarter may bring. Distributors report improvement in inquiries, especially from construction companies. Individual orders are low in tonnage involved. Sales of plate and structural shapes are growing. Sheet demand is slow with consumers holding large inventories.

Cleveland Sentiment among warehouse operators here is hopeful in spite of the fact order volume continues disappointing. Some distributors reported better March business than during February. Others, however, said their volume was off with consumers limiting purchases to prompt needs.

Prospects for improvement this month are considered only fair.

STEEL IMPORT PRICES

(Base, per 100 lb, landed, duty paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast*
Deformed Bars, Intermediate, ASTM-A-305	$4.55	$4.55	$4.50	$4.83
Hot Size Angles	4.40	4.40	4.85	4.68
Structural Angles	4.40	4.40	4.35	4.68
I-Beams	4.40	4.40	4.35	4.68
Wide Flange Beams	4.80	4.80	4.80	5.08
Sheet and Plate, 10 gage, 11 gage, 5' x 10'	5.50	5.50	5.45	5.78
Furring Channels, C.R., 1000 ft, ¾ x ¾ x 0.50 lb per ft	25.50	25.50	25.50	26.34
Barbed Wire	6.60	6.60	6.60	6.68
Merchant Bars	4.55	4.55	4.50	4.83
Hot Rolled Bands	4.70	4.70	4.65	4.98
Wire Rods, Thomas Commercial No. 5	4.72	4.84	4.82	5.09
Wire Rods, Q.H. Cold Heading Quality No. 5	5.23	5.30	5.28	5.86
Bright Common Wire Nails, 8d	6.55	6.65	6.60	6.85

*Not including $2.26 per net ton customarily charged in most West Coast ports for wharfage and handling.

Size O.D.	Wgt. Foot/Lb	Gulf Port	West Coast	Vancouver
Seamless A.P.I. Casing, Grade J-55:				
5½ in.	15.5	$1.47/ft	$1.51/ft	$1.32/ft
7 in.	23	2.10/ft	2.17/ft	1.90/ft
Seamless N-80 Casing:				
5½ in.	17	1.94/ft	2.00/ft	1.75/ft
7 in.	23	2.50/ft	2.70/ft	2.36/ft
Seamless J-55 Tubing:				
2⅜ in.	4.7	0.60/ft	0.63/ft	0.55/ft
2½ in.	6.5	0.80/ft	0.83/ft	0.73/ft

Sources of shipment: Western continental European (Schuman Plan) countries.

Competition is keen and freight equalization, if anything, is on the increase. Warehouse base prices, however, except for floor plates, are unchanged. Floor plates now are quoted 7.63c f.o.b. Cleveland warehouse against 7.79c formerly quoted.

Cincinnati — Warehouse customers are buying cautiously and reducing inventories. The price situation is less stable, quotations being shaded on liquidated stocks. Business is picking up slightly, however.

Chicago — Steel warehouse sales provide no pattern as to the future. Orders and tonnage stand at about the same levels as in March. There is some reason to believe a few sheet acquisitions are being made as a hedge against a possible steel strike this summer.

Philadelphia — While not on a level with last year, warehouse business is fairly active. March volume was some better than that of February and so far this month trading has held up. Warehouse base prices are unchanged, but sheet price reductions by two district mills, and the recent rail rate reduction leave the outlook a bit unsettled.

Waterbury, Conn. — Effective Apr. 15, the Chase Brass & Copper Co., subsidiary of Kennecott Copper Corp., begins merchandising stainless steel in sheet, bar, wire and tubing from its 27 warehouses and sales offices across the country through an arrangement with Crucible Steel Co. of America, Pittsburgh.

This move in no way affects the company's continued production and sale of brass and copper products.

San Francisco — Warehouses, encouraged by a slight pickup in March business, are anticipating a fairly good second quarter. Supplies are ample.

Los Angeles — For one warehouse, volume in March was 25 per cent greater than in February. With other distributors marking smaller but substantial gains, warehousemen are generally growing more optimistic.

Seattle — March warehouse order volume showed fair improvement over that for January and February. While inventories represent smaller investment than in recent years, they are well balanced. Some houses have added new products and sizes.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 153

San Francisco — March was a good month for nuts and bolts. This is an end of the steel business which usually precedes ups and downs for the industry, generally.

Some Prices Cut on Imported Steel

Reduction effected on major products, including sheets and plates, bars, reinforcing and building items. Importer sees 1.5 to 2 million tons brought in this year

New York — Prices on various steel products imported from western European countries are off substantially. Sheets and plates are down about 37 cents per 100 pounds here; at South Atlantic ports, 45 cents; Gulf ports, 42 cents; and on the West Coast, 47 cents.

Deformed bars have dipped from 20 to 30 cents at Eastern and Gulf ports, and 17 cents on the West Coast. Wide flange beams are easier by 14 cents per 100 pounds here and at Gulf and West Coast ports, and by 22 cents at South Atlantic ports.

Easing Noted — Merchant bars are lower by 10 to 20 cents, with greatest easing noted at South Atlantic and Gulf ports. On the other hand, barbed wire is up from 20 to 40 cents per 100 pounds. In bar sized angles, structural angles and I-beams, changes are relatively minor, up a little at some ports and down a bit at others. Wire rods show no change. The situation in nails is mixed. Seamless casing and tubing prices are steady.

Average Imports — Some 1.5 to 2 million tons of steel will be imported this year, predicts Kurt Orban, Kurt Orban Co. Inc. That's about what comes in during an average year, he says, and he expects 1954 to be up to the average.

Greatest proportional growth in sales of imported steel has been in the South, largely because the southern area has had a big growth. Also, many ports in the South can be served cheaper by water from abroad than by rail from domestic mills.

Flexible Operators Out — A lot of the "flexible operators" are now out of the import business as the Detroit automotive slowdown meant loss of sheet and plate sales to importers. Today there are few structurals and bars going into the Great Lakes region either.

Chief products coming in at present are merchant wire items, particularly barbed wire and nails, structural steel and reinforcing bars, angles, channels and I-beams.

Largest Tonnage Item — Reinforcing bars are the largest tonnage item coming in. It's strictly a price matter, particularly in the smaller sizes. Intermediate grade rebar is priced at $4.55 and size extras are practically nonexistent.

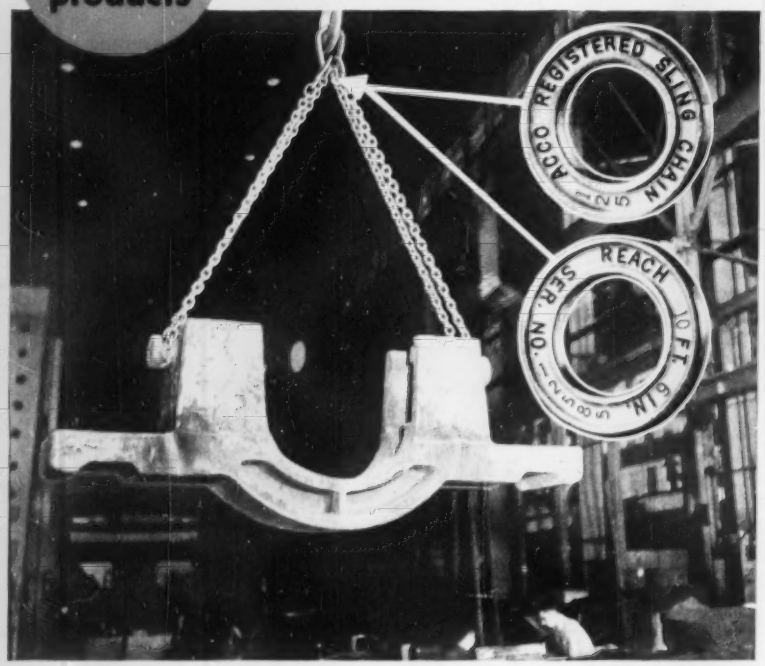
Quote Early Deliveries — European mills are quoting June delivery now.

Open Hearth Performs for "First-Nighters"

First heat is poured at Detroit Steel Corp.'s new open hearth shop at Portsmouth, O.; 250 tons of steel can be handled by the bucket, which is lifted to the ingot molds by a 76 ft, 360-ton pouring crane. Modern blooming mill and ten new circular soaking pits were put into operation at the same time.

ACCO products

ACCO Registered* Sling Chains



What would it cost you if you dropped this casting?

• How many times a day do you gamble with a heavy load being lifted over expensive machines—or men? If you have ever dropped a load, you know the consequences. Time lost, damages—a general mess.

That's why you must be sure of the slings you use. That's why we suggest ACCO *Registered* Sling Chains with their inherent safety. For instance, a ¾" ACCO *Registered* Sling Chain used in a double-basket hitch at a 60° angle has a working load limit of 11,400 pounds, almost six tons! Furthermore—it was proof-tested—overall—with a load equivalent to *twelve tons*.

With all this strength, ACCO *Registered* Sling Chains are light in weight . . . easy for your men to handle. That's because they're made of alloy chain which provides strength, great strength, with less weight.

There's much more to tell about these fine ACCO *Registered* Sling Chains. Call your ACCO *Registered* distributor today or write us for literature.

*Trade Mark Registered

WHAT "ACCO REGISTERED" MEANS . . .

1 The best material
2 Unit safety factor (on bodies, rings, links, hooks)
3 Proof test of complete sling to twice the working load limit
4 Actual field service test of each design
5 Metal identification ring on each sling
6 Signed Registry Certificate with each sling

ACCO

American Chain Division

AMERICAN CHAIN & CABLE

York, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Bridgeport, Conn.

plus Rings Links Hooks

on nails, late May on rebars, May on barbed wire, about 6 weeks on structural items.

Sheets, Strip . . .

Sheet and Strip Prices, Page 150 & 151

Philadelphia—Following the recent cut in hot and cold-rolled sheets of 65 cents per pound by the Fairless, Pa. producer because of the changed competitive position resulting from the reduction in rail freight rates, the Conshohocken, Pa. producer has reduced hot-rolled carbon sheets .075 cent from 4.05c per pound to 3.975c, the same as the base for hot-rolled at Fairless.

The rate before tax, from Conshohocken to Philadelphia is 7 cents per 100 pounds for 80,000-pound carlots and 8 cents for 40,000-pound carlots, against 9 cents and 10.50 cents from Fairless. From Conshohocken to New York it is 19 cents and 24 cents, compared with 16 cents and 20 cents from Fairless.

U. S. Steel Corp. has established mill base prices at its Fairless Works on its Cor-Ten hot and cold-rolled sheets and Man-Ten hot-rolled sheets, production of which was started at the works beginning second quarter. Shipments will be in limited volume and size range during the initial period of production.

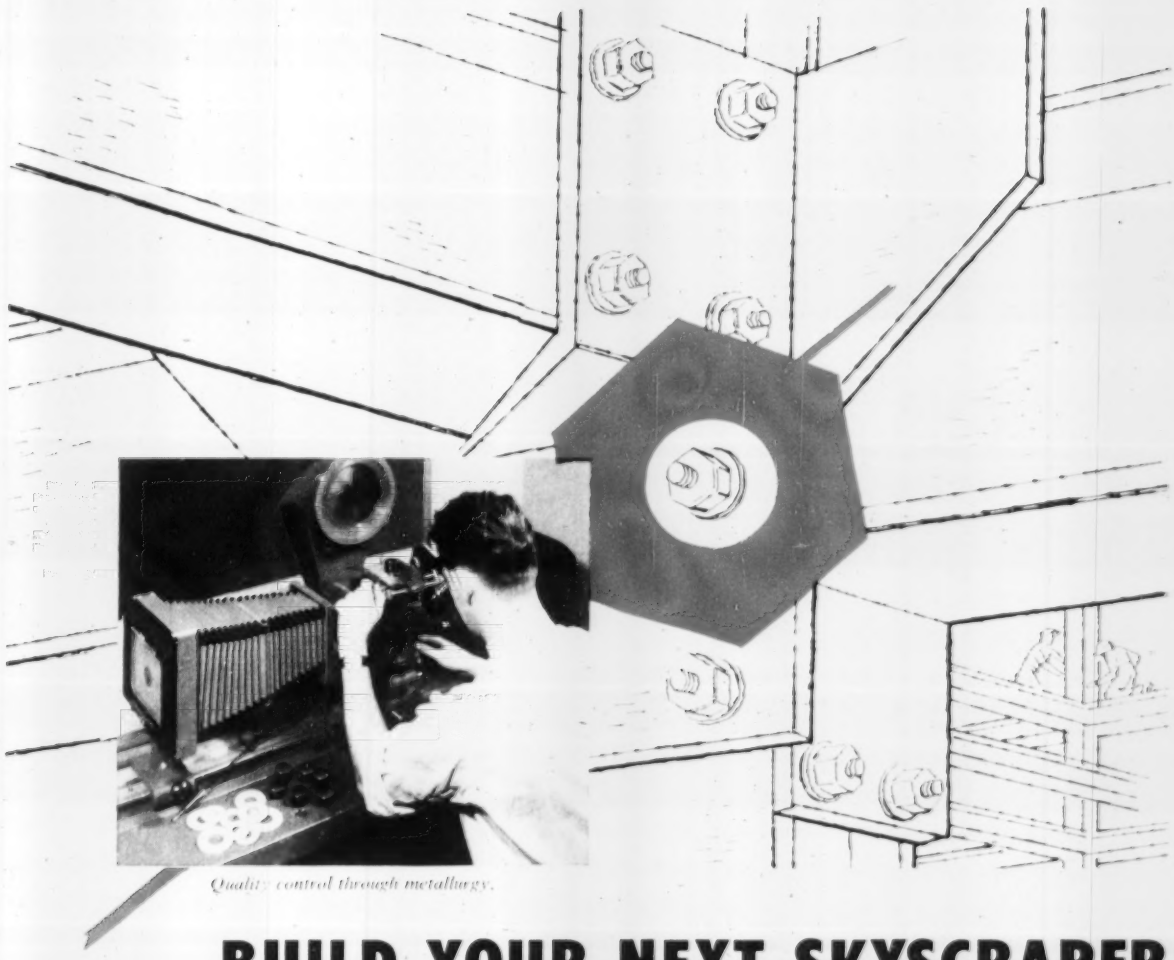
The base prices at Fairless are: Cor-Ten hot-rolled sheets, 5.95c; Cor-Ten cold-rolled sheets, 7.275c; Man-Ten hot-rolled sheets, 4.825c. These prices, which are $1 per ton higher than at Pittsburgh, will result generally in lower delivered prices to the company's customers in the East Coast market in comparison with shipments from Pittsburgh and other U. S. Steel plant locations.

Boston—Changing specifications in flat-rolled requirements marks product production transfers among several larger consumers. General Electric, Westinghouse, Worthington and American Bosch are among plants involved with small motors, air conditioning, aircraft engines, including components, and appliances effected. Heavier volume of electrical silicon sheets in cut lengths rather than coils and other revisions in steel requirements will follow. More diversification is also a factor.

Gain in sheet and strip bookings is slight, excluding wasters, excess primes and tin mill black. There are openings in April schedules, including galvanized at most mills.

Among consumers, air conditioning is active.

Hot and cold-rolled sheets deliv-



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Second, they are easier, less costly and safer to install.

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Where does Lindberg Steel Treating Company get into the act? Ours is simply a supporting role.

We heat treat the steel washers.. carloads of them for the U. S. Steel Supply division* of United States Steel Corporation.

Lindberg Steel Treating Company is equipped to handle your production heat treating, too. Giant heat treating furnaces.. skilled heat treaters are at your command. What do you make.. forgings, castings, wire products, fasteners, springs, wrenches, pins and bushings? Whatever it is, and whatever your volume.. ten thousand or ten million.. call Lindberg Steel Treating Company.

Heat treaters: *Have you written for your copy of the "condensed tempering chart"? It's a finger tip guide to the tempering of practically all types of steels. Available without charge.*

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A case history of Lindberg Steel Treating Co. service to American industry

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CHAIN HOISTS — OVERHEAD TRAVELING CRANES — ELECTRIC HOISTS

ered Boston from Fairless, Pa. are 1.405c and 5.255c respectively.

New York—Of the major grades of sheets, cold-rolled are in best demand and there is room for improvement. Question continues whether April rollings will exceed March. Preponderance of opinion is April production will be some better, but few make definite predictions to that effect.

In recognition of the changed competitive position resulting from recent reduction in eastern railroad freight rates, the Fairless, Pa., producer has dropped prices $1 a ton on hot and cold-rolled carbon sheets. This means a drop to 3.975c per pound for hot carbon sheets, 18 gage and heavier, and to 4.825c per pound for cold carbon sheets. The delivered New York prices on hot sheets are now 4.175c for 40,000-pound lots and 4.135c for 80,000-pound lots. Delivered prices on cold sheets here are 5.025c on 40,000-pound lots and 4.985c on 80,000-pound lots. These prices are predicated on freight rates before federal tax.

Pittsburgh—Cold-rolled sheet sales in early second quarter are near the low point of the year. Warehouses have large stocks. Pickup in sales to automakers is not expected before May, when other consumers are expected to complete inventory adjustment.

Cleveland—Sheet makers continue to report sluggish demand. Order volume has been disappointing every month this year and the outlook for May is not much improved. In fact, sellers think the sluggishness will hold pretty much through the first half of the year. Automotive demand for May is not coming out as had been expected.

St. Louis—Demand for galvanized sheets sent Granite City Steel Co. to capacity galvanizing operations last week. This followed doubling of ingot production a week earlier. Farm roofing demand, already heavy, is showing seasonal increase, which put the last of the company's four pots into operation.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 150

Chicago—Business for steel reinforcing material continues good with inquiries for bids keeping sellers swamped. Much of the work is small, but tonnage adds up to significant proportions. Despite this, keen competition makes for price concessions.

New York—While recent orders haven't been heavy, the outlook in reinforcing bars is promising. Road

The CECO-DROP makes other gravity drop hammers obsolete

Builders of THE IMPACTER

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CHAMBERSBURG ENGINEERING CO., CHAMBERSBURG, PA.

What do you think of when you hear the word *medical?* . . . Your family doctor? Your local hospital? Miracles of modern surgery? The impressive procession of new life-saving drugs?

Whatever comes to mind, remember this: no matter how specialized the various branches of medicine may be, they must all depend on one single source of manpower America's compact network of 79 medical schools.

These schools constitute the fountainhead of all medical services. Without their graduates, no hospital, no medical research laboratory, no health agency could function.

Right now, the medical schools need your help. They need it urgently. They need it to provide enough doctors for our growing population and our military services, to maintain our unparalleled medical progress. Because medical education is of such vital importance to every American, more and more businessmen are coming to regard it for what it truly is . . . one of our great national resources, like the Red Cross, Community Chest and other essential public service agencies.

Let us tell you how you can help. Write for more details on the medical schools' needs, and how your firm can contribute to the solution of this serious national problem.

FACTS YOU SHOULD KNOW ABOUT MEDICAL EDUCATION

- There are only 79 accredited medical schools in the United States.
- They train 82,000 undergraduates, specialists and technicians and graduate 6,500 doctors annually.
- It costs from $10,000 to $12,000 to train a doctor today.
- Tuition fees, raised 84% over 1940, cover less than 20% of the cost.
- In the past decade medical teaching budgets have risen 143%; administration and plant operation 150%.
- The medical schools need $10,000,000 annually in additional income to maintain present standards and train the necessary number of doctors required for America's growing population.
- *ALL* 79 medical schools can be aided by a *single* gift to the National Fund for Medical Education.
- Contributions are distributed through annual grants according to a schedule approved by the medical schools.
- The National Fund is a voluntary, non-profit organization approved and supported by the American Medical Association and the Association of American Medical Colleges.

For complete facts on the crisis facing medical education write to

The National Fund for Medical Education, 2 West 46 Street, New York 36, New York

without the roots there can be no tree

Industrial Medicine

Public Health

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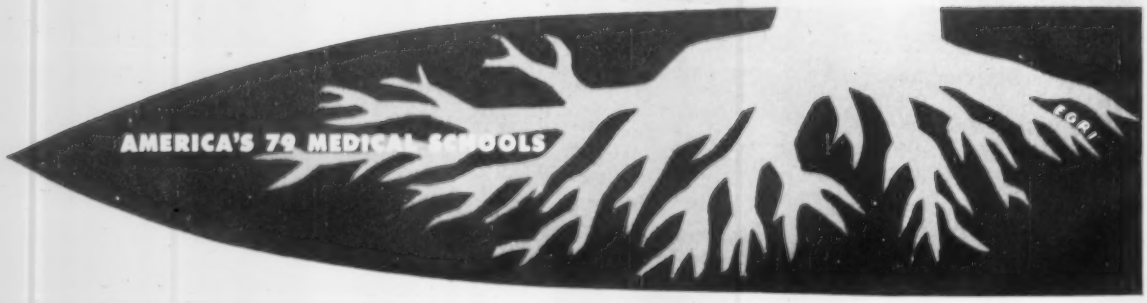
Geriatrics

Antibiotics

Medical Research

MEDICAL EDUCATION KEEPS AMERICA HEALTHY



work is expanding and there is considerable tonnage pending for schools, especially on Long Island.

Los Angeles The spring flood of engineering construction projects is giving a brisk tone to reinforcing bar demand.

Seattle Rolling mill operations here are sustained. Considerable small-lot tonnage has been booked, and backlogs are fairly stable.

Structural Shapes . . .

Structural Shape Prices, Page 150

Philadelphia Shapes are moving at a good clip and competition among fabricators continues sharp. There is an accumulation of inquiry.

Pittsburgh With construction projects requiring almost as much steel as last year, fabricators are increasing their orders. Wide flange beams and angles are in good supply.

Cleveland Seasonal upswing in building and construction activity is being reflected in a strong demand for structurals and other building steel items. Along with merchant wire items and tin plate, building steel appears to be in most active demand of all major steel products. This in part is accounted for by the fact tight supply conditions that prevailed in structurals all last year prevented the building up of large stocks by fabricators.

Boston Structural fabricating shops are buying less plain material for inventory. Backlogs average around three months, but structural orders are mostly for fill-in. New freight rates do not apply to structurals and Pittsburgh tonnage is at a disadvantage of close to $1.30 a ton. Less fabricated work is being estimated with some decline in new contracts.

New York Structural activity is undergoing further improvement. Bridge work is expanding and there is a greater diversification of tonnage generally. Fabricators anticipate a good first half, with the current quarter up seasonally from the 3-month period just ended.

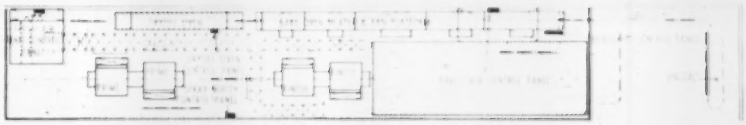
Chicago Structural shapes are moving into the comfortable supply category along with other products. This is despite a good level of construction generally.

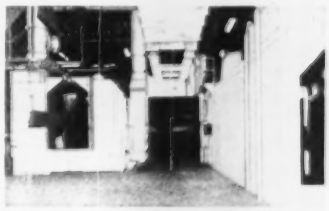
San Francisco Considerable tonnage of structural shapes is going into ramps and freeways in this territory.

Seattle Fabricators report business is improving. Small contracts are increasing in number. Growing competition is noted, in many instances contractors' bids being well

P-D

Room Conditioner Manufacturer Builds Plant in Deep South... Chooses Complete Peters-Dalton Paint Finishing System





Specialized Engineering — Backed By Experience

The rapidly expanding Room Conditioner field requires more manufacturing capacity. To meet these requirements, one manufacturer constructed a new plant in Alabama. When planning the plant layout, utmost consideration was given to installing the best and most efficient equipment. For the complete paint finishing operations, Peters-Dalton, Inc. was chosen. Illustrated here is a small part of this Finishing System—it was designed and installed by P-D engineers.

Space saving was of great importance, and layout for the practical flow and handling of parts and finishing required complete understanding of the manufacturer's needs. These were solved by P-D engineers. The system they installed is now functioning smoothly . . . and efficiently handling production requirements at minimum cost.

Hydro-Whirl Paint Spray Booths • Industrial Washing Equipment
Drying and Baking Ovens • Hydro-Whirl Dust Collecting Systems

P-D Peters-Dalton INC.
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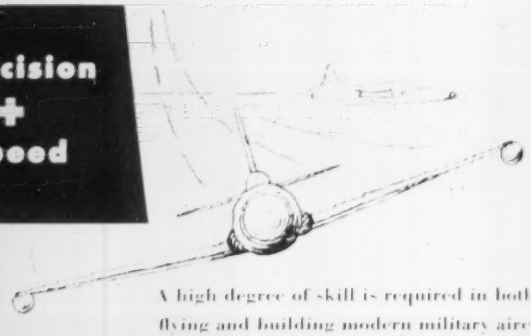
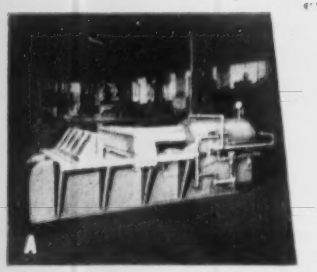
precision + speed



A high degree of skill is required in both flying and building modern military aircraft. BEATTY machines, like the latest of the supersonic jet jobs, are precision-built to afford maximum accuracy and speed in metal fabricating operations. Let a BEATTY engineer analyse your industrial machine needs—if one of the machines shown doesn't answer your production problem, we'll design and build one to your exact requirements.



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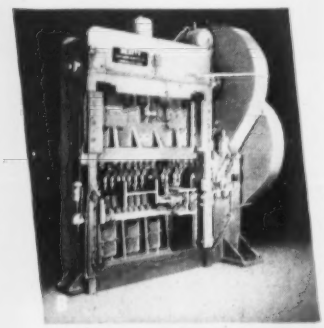


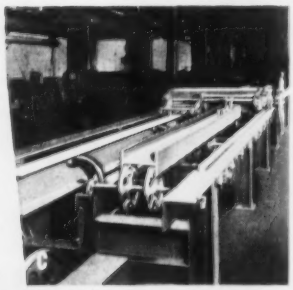
A. BEATTY Horizontal Hydraulic Bulldozer for heavy forming, flanging and bending.

B. BEATTY Guillotine Beam Punch. Punches webs and flanges in "I" beams from 6 to 30 inches.

C. BEATTY Spacing Table handles web and flange punching without roll adjustment.

D. BEATTY Gap Type Press for forming, bending, flanging, pressing. Capacity 250 tons.

E. BEATTY Guillotine Bar Shear for angles, bars, rounds, squares without changing tools.



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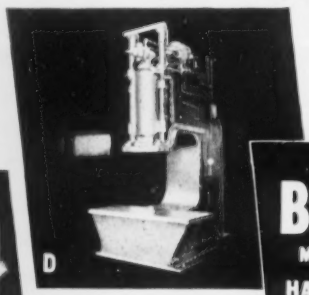

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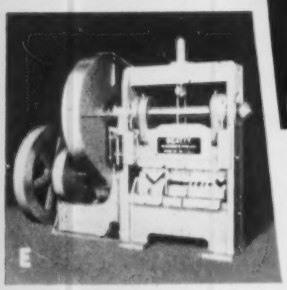


E

BEATTY
MACHINE & MFG. CO.
HAMMOND, INDIANA

within estimates. Several important jobs involving structurals are up for immediate action.

Wire . . .

Wire Prices, Page 155

Cleveland—Some seasonal improvement in merchant wire demand is noted. Sellers also report a little more activity in manufacturers wire and rods.

Boston—Orders are heavier, notably for manufacturers grades, and to some extent cold-heading stock. Not only are April orders improved over the previous month, but some tonnage is being placed for May.

New York—Reflecting the recent increase in the price of zinc, the United States Steel Export Co., subsidiary of U. S. Steel Corp., announced new export price bases on various wire products, freight included to New York, Philadelphia and Baltimore. Effective Mar. 30, the new prices are: Galvanized plain wire, $6.98 per 100 pounds; barb wire, Glidden 4-pt 3-in. or 6-in., $7.93; Iowa, 4-pt 3-in. or 6-in., $7.93 and Waukegan, 4-pt 3-in. or 6-in., $8.03; galvanized staples, $8.71.

Steel Bars . . .

Bar Prices, Page 150

Boston—Forge shops are pounding out less tonnage for automotive and defense products. The cutback in government contracts has hurt alloy consumption. Aircraft forging operations are maintained, but aluminum alloys account for the bulk of the metal used.

Stress relieving extra of 1.25 cents a pound on five grades of stainless steel billets and bars, 403, 405, 410, 416 and 416S, has been dropped.

First shipment of vacuum-melted steel has been made from Sanderson-Halcomb Works, Crucible Steel Co. of America, Syracuse, N. Y. The steel is being produced under Crucible-National Research Corp. agreement following purchase by Crucible of 50 per cent interest of Vacuum Metals Corp., Cambridge, Mass., subsidiary of National Research Corp.

Philadelphia—Hot-rolled carbon bar business is about the same. Seldom, in recent years, has railroad buying been so dull. Miscellaneous demands, however, are not bad.

Pittsburgh—Seasonal improvement in sales to agricultural equipment producers are beginning to diminish. Most equipment required for sale this spring is already in stock. Sales of hot-rolled bars are slow.

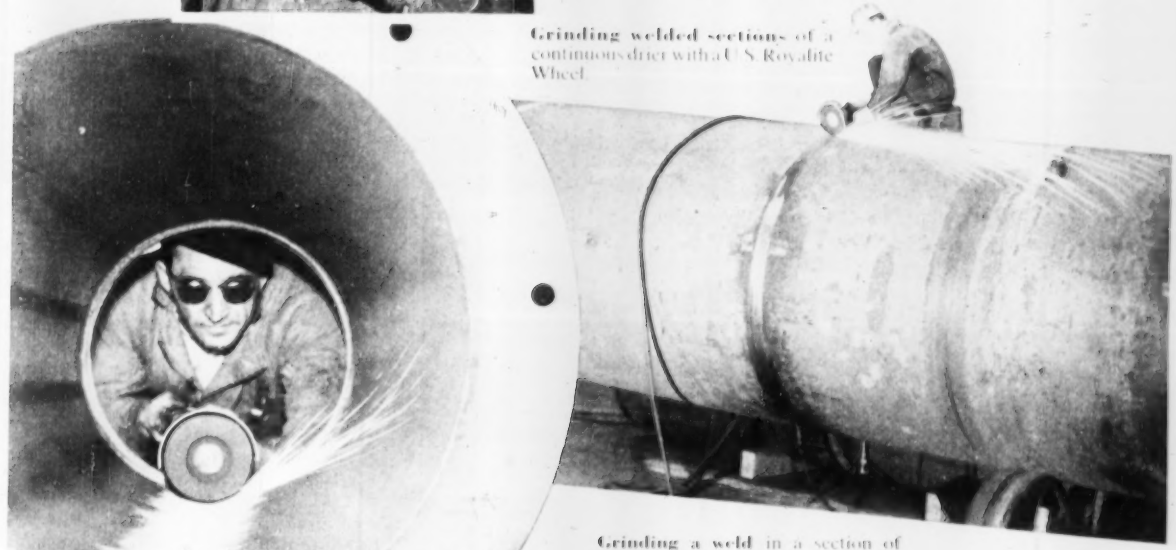
Cleveland—With hot-rolled bars in easy supply there is a noticeable lack

Jobs cost you less...

because "U. S." Grinding Wheels give you more!

The worker at left smoothing edges before welding is using a resinoid U. S. Royalite® Wheel selected from thousands of combinations of sizes and constructions. United States Rubber Company sales engineers know that there is a right wheel to do the best work on the job at hand. That's why they examine your own application closely, talk to your workmen, make field tests—in order that they may come up with the *best* wheel. Whether you are snagging castings or grinding ball races, billets, bars, slabs, you'll find a U. S. Royalite Wheel that's right for the job.

Don't forget that the "U. S." sales engineer is a specialist in resinoid or rubber bonds and abrasives. Give him your problems. It pays off. Write to address below.



Grinding welded sections of a continuous drier with a U. S. Royalite Wheel.

Grinding a weld in a section of a new air duct for a steel mill, using a U. S. Royalite straight-side wheel.

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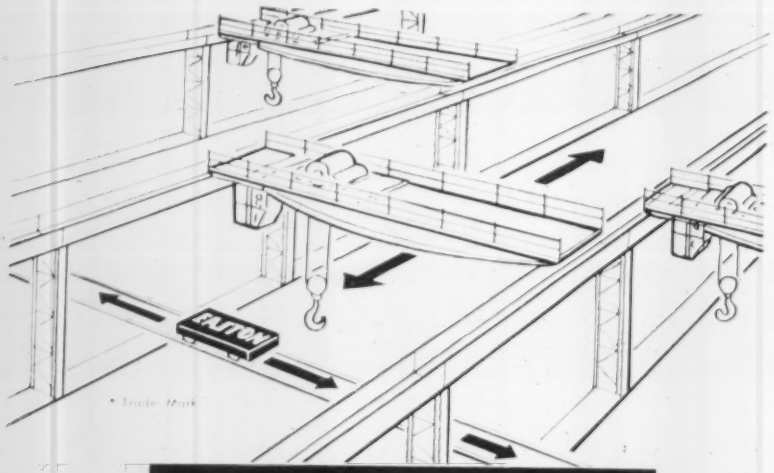
Automatic motor-driven transfer cars provide a universal handling system in modern parallel bay plants now served by overhead cranes. Also for transfer between plant buildings.



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EASTON CAR & CONSTRUCTION COMPANY • EASTON, PA. • NEW YORK • PHILADELPHIA • PITTSBURGH

THIS IS LOW COST WELDING!

When a touch on a button moves weldments like these into the correct, most convenient position for a downhand pass, you get more arc time, more welding at lower cost. C-F power operated Positioners rotate the work in a full circle at any point in a range of 135° from the horizontal giving welders a choice of an infinite number of downhand welding positions instantly.

Every requirement for faster, better positioned welding constant or variable speed table rotation, full 135° tilt, self-locking gearing which holds the table in any position, oversize built-in main tilt and rotating bearings, choice of two base styles, and many other features are built into C-F Positioners.

C-F Positioners are available in Hand or Power operated models, and are made in capacities up to 30,000 lbs. and larger.

Write for the new C-F Positioner Catalog

CULLEN-FRIESTEDT CO.
1308 S. Kilbourn Avenue Chicago 23, Illinois

CULLEN-FRIESTEDT CO., CHICAGO 23, ILL.

C-F positioned welds mean better, more economical welds

of consumer pressure in the market. Since tonnage is available for quick shipment buyers are disinclined to order for inventory and, in some cases, stocks have not been completely liquidated.

Plates . . .

Plate Prices, Page 150

New York Plate requirements for oil storage tanks are picking up a little, and this, combined with a broadening in structural needs generally, is important in at least sustaining plate demand. Requirements for pressure vessels constitute a sustaining factor, offsetting the continued lag in railroad equipment and shipyard business. An increase in over-all demand or at least an appreciable pickup, still awaits further reduction in consumer inventories.

Boston Slightly improved demand for carbon plates is confined to the lighter gages. Tank work and miscellaneous shop fabricating accounts for the gain, held largely to specific requirements.

Philadelphia Plate demand continues sluggish. Dearth of specifications from railroad equipment builders and shipyards is being particularly felt by district mills.

Pittsburgh Improving weather for construction purposes boosts sales of plates to a good level. Small fabricators report a growing number of inquiries.

Birmingham Plate demand continues relatively strong. Some newcomers to the industrial district say they are not being adequately supplied.

Seattle Jobs involving plates consist mostly of municipal water storage tanks but several sizable projects will be placed shortly.

Semifinished Steel . . .

Semifinished Prices, Page 150

Chicago At least two mills in this area are building inventories of semifinished steel again. Both found the recent planned reduction was carried too far and that some rollings of various products were delayed because proper sizes or analyses of slabs, billets, etc., were not immediately available. Despite the build-up, there is a possibility ingot output in April may fall below that of March. The rate of 73.5 per cent for last week was the lowest for any week since the steel strike in mid-1952.

Philadelphia Production of steel and pig iron at the Steelton, Pa., works of Bethlehem Steel Co. will be suspended Apr. 17 for several

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BONDERITE corrosion resistant paint base

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weeks to permit reconstruction of the 44-inch blooming mill and also repairs in other sections of the rolling mill.

Coke production will be maintained to furnish requirements of the Harrisburg Gas Co., and also to provide gas for such continuing operations as are scheduled in the railroad equipment and structural fabricating shops of the company.

Sharon, Pa.—Sharon Steel Corp. took off one of the four open hearths it was operating at the Roemer Works at Farrell, Pa.

Tin Plate . . .

Tin Plate Prices, Page 152

Washington—Shipments of metal cans in 1953 totaled 4,082,254 short tons, according to final figures by the Bureau of Census, Department of Commerce. This represented an increase of 6 per cent over 1952. Monthly shipments in 1953 ranged from a low of 192,403 tons in December to a high of 506,215 tons in August.

Cleveland—Tin mills are reported operating close to capacity to meet the strong seasonal demand coming in from canmakers. Currently, tin plate, along with wire, silicon sheets and stainless sheets, is among the few major steel products experiencing an upturn in demand over recent weeks.

Chicago—Canmakers appear to be making sure their operations won't get stymied in event of a steel strike this year. Their ordering of tin plate is keeping tin lines operating at a good clip and inventories are rising markedly.

San Francisco—Tin plate consumption in California this year is expected to reach between 750,000 and 760,000 tons. This would compare with about 700,000 tons consumed in 1953. California's beer industry, alone, is expected to need more than 600 million cans in 1954, compared with 550 million in 1953.

Tubular Goods . . .

Tubular Goods Prices, Page 153

New York—Business in merchant pipe is definitely more active, reflecting seasonal influences. Construction and building alterations and repairs are increasing, and demands for merchant pipe are expanding accordingly. This pickup is especially noticeable in buttweld in the ½ to 4-inch range.

Boston—Merchant steel pipe distributors are buying small lots for prompt delivery, taking shipments out of stock within one week on some buttweld and seamless sizes.

Pittsburgh—Producers expect demand for o.l. country goods to remain high through second quarter. Welded tubing sales, at a fair level for several months, may decline.

Seattle—Cast iron pipe demand is improving. Beaverton and Scappoose, Oreg., and Kent, Wash., have opened bids for unstated tonnages.

Iron Ore . . .

Iron Ore Prices, Page 173

Cleveland—Lake ore vessel operators are fitting out various ships of the lake fleet though the ore shipping season is not expected to really get under way until late April.

Canada . . .

Hamilton, Ont.—Steel Co. of Canada Ltd., reports 1953 sales at $214,226,613 and net profit of $14,257,440. This compares with sales of $190,214,161 and net profit of $13,163,158 in 1952.

The profit increase was largely due to replacement of high cost purchased steel with steel made in the company's own furnaces. Also, higher efficiency of modern equipment.

Stainless Steel . . .

Stainless Steel Prices, Page 154

Pittsburgh—Strong first quarter improvement in sales failed to continue into April at the same rate. Now demand is declining.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1315 tons, industrial building, Sandvik Steel Co., Fairlawn, N. J., through Frank A. McBride, general contractor, to Lafayette Iron Works, Jersey City, N. J.

1250 tons, general shops, concentrating plant, Erie Mining Co., Aurora, Minn., to Bethlehem Steel Co., Bethlehem, Pa.; this is the second structural subtract placed for this project recently.

LEWIS
TRAVEL-CUT
automatic, high-speed
heavy-duty
WIRE STRAIGHTENING
and
CUTTING MACHINES
Sizes for .012" to ¾" WIRE
ROUNDS & SHAPES
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Refractory Porcelain Specialties in stock or designed to meet specific needs. Flasks, retorts, crucibles, etc. and parts "custom made" to do the job.

for Carbon and Sulphur Determinations

Precision made in every detail, McDanel High Temperature Porcelain Combustion Tubes have been favorites in America's metallurgical laboratories since 1919. Made of a highly refractory porcelain body and recommended for 2900 F. service, McDanel Tubes give maximum resistance to thermal shock. Their long life keeps control costs at rock bottom.

Write Today for 1954 Catalog
"McDanel Industrial Porcelains"

McDANEL REFRACTORY PORCELAIN CO.
BEAVER FALLS, PENNA.

510 tons, replacement of metal storage building, Navy Yard, Brooklyn, through James Stewart & Co., engineers, to Ditemza Co., New York.

920 tons, 17-story apartment, Manhattan, New York, through MacArthur Construction Corp., to Schacht Structural Steel Inc., that city.

955 tons, Battelle Hall, state hospital, Middletown, Conn., to Connecticut Steel Co., New Haven; Widhams & May Co., Hartford, Conn., general contractor.

105 tons, convent of Our Lady of the Retreat in the Cenacle, Mt. Kisco, N. Y., through William A. Berbusse Jr. & Co. Inc., to Dreier Structural Steel Co. Inc., Long Island City, N. Y.

775 tons, No. 3 crane runway, General Electric Co., Pittsfield, Mass., to Schenectady Steel Co., Schenectady, N. Y.

275 tons, building, College of Sacred Heart, Newton, Mass., to A. O. Wilson Structural Co., Cambridge, Mass.

240 tons, building, United States Rubber Co., Jackson Heights, New York, through T. Kretzer & Son, general contractors, to Calvin Iron Works, that city.

200 tons, Bureau of Public Roads, bridge near Packwood, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle, $75,351.

[illegible] tons, state bridge, Perry county, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.

110 tons, one-story manufacturing building, Fairlawn Industrial Park Inc., Fairlawn, N. J., for occupancy by Fairbanks-Morse & Co., to Lafayette Iron Works, Jersey City, N. J.

[illegible] tons, state bridge, Schuylkill county, Pennsylvania, to Phoenix Bridge Co., Phoenixville, Pa.

100 tons, municipal filter building, Grandell, N. J., to Park Steel & Iron Co., a local district fabricator.

STRUCTURAL STEEL PENDING

700 tons, 14-story apartment, 68th St. and Madison Ave., New York, bids in.

260 tons, 26 towers, knocked down, with fasteners; bids to Corps of Engineers, Albuquerque, N. Mex.

200 tons, steel frame hangar, Gore Field, Great Falls, Mont.; bids to U. S. Engineer, Seattle, Apr. 20.

190 tons, wide flange, Navy; bids Apr. 16, inv. 7792-B, Washington.

130 tons, also 22 tons reinforcing bars, 210-ft steel truss bridge, Snohomish county, Washington; bids to Bureau of Public Roads, Portland, Oreg., Apr. 15.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1100 tons, 4-story addition to Bon Marche department store building, Seattle, to Northwest Steel Rolling Mills Inc., Seattle; Bennett Campbell Co. Inc., Seattle, general contractor.

REINFORCING BARS PENDING

515 tons, Garden State parkway, contract No. 4, sec. 1, Bergen county, New Jersey; bids Apr. 26; also 200 linear feet of 6- and 10-inch cast iron water pipe.

100 tons, T-beam Washington state highway bridge, Spokane county; bids to Olympia, Apr. 20.

PLATES . . .

PLATES PENDING

320 tons, 1-million-gal tank, medical center, federal prison, Springfield, Mo.

200 tons, 100,000-gal tank, veterans' hospital, Lyons, N. J.; bids May 4, Washington.

PIPE . . .

STEEL PIPE PLACED

2940 tons, fabricated steel pipe, Public Service Electric & Gas Co., New Brunswick, N. J., to Colorado Fuel & Iron Corp. (Claymont Del. plant) and National Tube Co.

RAILS, CARS . . .

RAILROAD CARS PLACED

Central Railroad of New Jersey, four fish chase cars, to Budd Co., Philadelphia.

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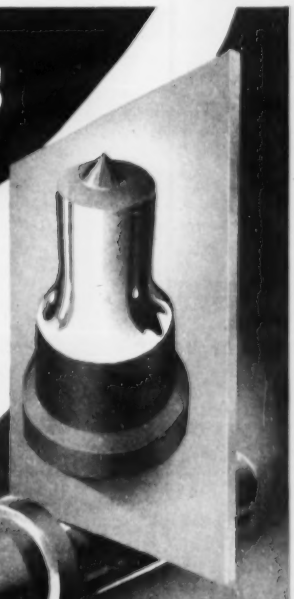

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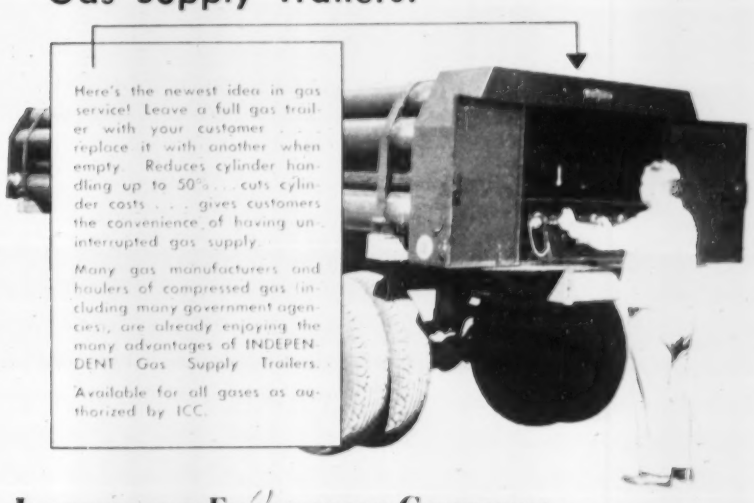

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CURRENT FERROALLOY QUOTATIONS

Prices as reported to STEEL

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1.5% Si, 6% Cmax) per gross ton $86, Palmerton, Pa., $87 Clairton and Duquesne, Pa.

(16 to 19% Mn) $84 per ton, Palmerton, Pa., $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $200, Clairton, Duquesne, Johnstown and Riverdale, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; and Portland, Oreg.; add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 78% or under 74% respectively.

(Mn 75-81%, Liquid $26 per net ton, f.o.b. Charlestown, Great Falls, Mont. Add $2 for each 1% or fraction thereof of contained Mn over 81%. Contract $2.50 for each 1% or fraction thereof of contained Mn over 81%. Deduction is proportional for lower analysis.

Low Carbon Ferromanganese, Regular Grade: (Mn 85-90%, C 0.07% max., P 0.07% max., Si 1.5% max.) Carload, lump, bulk, max. 0.07% C, 24.5c per lb of contained Mn; carload packed 25c; ton lots 25.5c; less ton 27c. Delivered. Deduct 0.5c for max. 0.10% C grade from above prices. Add 0.5c for max. 0.05% C and 1.5c for max. 0.03% C. Add 2.5c for **Special Grade:** (Mn 90% min., C 0.03% max., P 0.06% max.) Add 2c to the above prices. Spot, add 0.25c.

Medium Carbon Ferromanganese: (Mn 80-85%, C 1.5% max.) Carload, lump, bulk 21.5c per lb of contained Mn; carload packed 22.5c; ton lots 23.5c; less ton 25c. Delivered. Spot, add 0.25c.

Manganese metal: (2" x 1" (Mn 99.9% min., Fe 0.2% max., C 0.2% max.) Carload, lump, bulk 39.5c per lb of metal; packed 40.5c; ton lots 42c; less ton 44c. Delivered. Spot, add 2c.

Electromanganese: (Mn, carload, 30c, 2000 lb to 40,000 lb, carload, 32.5c; 2000 lb to less than 20,000 lb, 34c. Premium for hydrogen removed metal, 2c per lb. f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%, C 1.5% max., Si 16-20%, P 0.25% max.) Contract, lump, bulk 14.5c per lb of alloy, carload packed 15.5c; ton lots 17.5c. Freight allowed for 2" x 1" grade (Si 15-17%) deduct 0.2c from above prices. For 5%" x 2" grade (Si 12-14%) deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low Carbon: (Ti 20-25%, Al 2.5% max., Si 4% max., C 0.10% max.) Contract, ton lots, 2" x 1" to 8" over, 85c per lb of contained Ti; less ton $1.05. (Ti 25-45%, Al 5% max., Si 4% max., C 0.10% max.) Ton lots $1.35; less ton $1.37. f.o.b. Niagara Falls, N. Y. Freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High Carbon: (Ti 15-18%, C 6.5% max.) Contract $177 per net ton, f.o.b. Niagara Falls, N. Y. Freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium Carbon: (Ti 17-21%, C 2.5% max.) Contract $195 per ton, f.o.b. Niagara Falls, N. Y. Freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High Carbon Ferrochrome: Contract, carload, lump, bulk 24.5c per lb of contained Cr, packed 25.5c; ton lots 26.5c; less ton 28.5c. Delivered. Spot, add 0.25c.

Low Carbon Ferrochrome: (Cr 67-72%) Contract, carload, lump, bulk, max. 0.02% C (actual analysis 64.5% per lb contained Cr, 0.01% C 66.00, 0.015% C 65.50, 0.02% C 65.00, 0.03% C 64.50, 0.04% C 64.00, 0.05% C 63.75, 0.06% C 63.50, 0.07% C 63.25, 0.08% C 63.00, 0.09% C 62.75, 0.10% C 62.50, 0.15% C 62.25, 0.20% C 62.00, 0.25% C 61.75, 0.30% C 61.50, 0.35% C 61.25, 0.40% C 61.00, 0.50% C 60.75, 0.60% C 60.50, 0.70% C 60.25, 0.80% C 60.00, 0.90% C 59.75, 1.00% C 59.50, 1.25% C 59.25, 1.50% C 59.00, 2.00% C 58.75, 2.50% C 58.50, 3.00% C 58.25, 3.50% C 58.00, 4.00% C 57.75, 4.50% C 57.50, 5.00% C 57.25, 6.00% C 57.00, 7.00% C 56.75, 8.00% C 56.50, 9.00% C 56.25, 10.00% C 56.00) carload packed 1.1c; ton lots 2.2c; less ton 3.2c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 4-6.5%) Contract, carload, lump, bulk 26.2c per lb contained Cr. Packed, 27.2c; ton lots 28.2c; less ton 30.2c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 58-62%, C 2.5% max.) Contract, carload, packed, 33.5c x D, 13.4c per lb of alloy; ton lot 16.2c; less ton lot 20.1c delivered. Spot, add 0.25c.

Low Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 1" x down and 2" x down, bulk 24.7c per lb of contained chromium plus 16.8c per pound of contained silicon; 1" x down, bulk 25.9c per pound of contained chromium plus 12.6c per pound of contained silicon. F.o.b. plant. Freight allowed to destination.

Chromium Metal: (Min. 97% Cr and 1% Fe) Contract, 1" x D, packed, max 0.50% carload $1.12 to 5 lots $1.14; less ton $1.16. Delivered. Spot, add 2c. Prices on 0.10 per cent carbon grade, add 4c to above prices.

VANADIUM ALLOYS

Ferrovanadium: (open-hearth Grade (V 35-55%, Si 5-12% max., C 2.5-3.5% max.) Contract any quantity $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible Special Grades** (V 35-55%, Si 2.5% max., C 0.75% max.) $3.10. **Primos and High Speed Grades** (V 35-55%, Si 1.00% max., C 0.20% max.) $3.20.

Grainal: (Vanadium Grainal No. 1) $1 per lb, f.o.b. Niagara Falls, N. Y., freight allowed to destination east of Mississippi river.

Vanadium oxide: Contract, less carload lots $1.25 per lb contained V2O5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30%, Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.0c; ton lot 22.5c, f.o.b. Niagara Falls. Freight not exceeding St. Louis rate allowed.

50%, Ferrosilicon: Contract, carload, lump, bulk, 10.5c per lb of contained Si, carload packed 12.0c; ton lot 13.5c; less ton 15.0c. Delivered. Spot, add 0.15c.

Low Aluminum 50%, Ferrosilicon: (Al 0.10% max.) Add 1.5c to 50% ferrosilicon prices.

65%, Ferrosilicon: Contract, carload, lump, bulk, 12.2c per pound contained silicon, carload packed 13.5c; ton lots 14.7c; less ton 16.1c delivered. Spot, add 0.2c.

75%, Ferrosilicon: Contract, carload, lump, bulk, 13.8c per lb of contained Si, carload packed 15.1c; ton lot 16.2c; less ton 17.6c Delivered. Spot, add 0.2c.

90-95%, Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c; ton lot 19.1c; less ton 20.2c Delivered. Spot, add 0.2c.

Silicon Metal: (Mn 97% Si and Fe max each 1% lump, bulk, regular 18.2c per lb of Si, carload packed 19.7c; ton lot 20.6c; less ton 21.8c. Add 0.3c for max. 0.10% calcium grade. Deduct 0.3c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe) Contract basis f.o.b. Niagara Falls, N. Y. lump carload bulk, 9.9c per lb of alloy; ton lots packed 11.30c; 2 to 19.9c ton 11.6c; smaller lots 12.15c.

ZIRCONIUM ALLOYS

12-15%, Zirconium Alloy: (Zr 12-15%, Si 30-35%, Fe 10-15%, C 0.20% max.) Contract, carload, lump, bulk 8.6c per lb of alloy, packed 9.2c; ton lot 9.5c; less ton 10.3c. Delivered. Spot, add 0.25c.

35-40%, Zirconium Alloy: (Zr 35-40%, Si 17-22%, Fe 8-12%, C 0.40% max.) Contract, carload, lump, packed 20.2c per lb of alloy; ton lot 21c; less ton 22.2c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17-20% max., Si 1.0% max., Al 0.50% max., C 0.50-1.0% max.) Contract, ton lots or more 1" x D, $1.20 per lb of alloy. Less than ton lots $1.30. Delivered. Spot, add 5c. Each Washington Pa., prices 1no lb and over are as follows: Grade A (B 14% Bo 56c per pound; Grade B (11-14%) Bo $1.20; Grade C (10% min. B) $1.40.

Borosil: (3 to 4% B, 40 to 45% Si) $3.25 per lb contained B, delivered to destination.

Bortam: (B 1 to 1.99%) Ton lots, 65c per lb, smaller lots 70c per lb.

Carbortam: (B 1 to 2% Contract, lump, carloads 9.5c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%) Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c; less ton 23.3c Delivered Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%) Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c; ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3½ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk 16.2c per lb of briquet, carload packed 16.9c; ton 17.7c; less ton 18.6c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.4c per lb of briquet, c.l. packaged 13.2c; ton lot 14.0c; less ton 14.9c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Siliconmanganese Briquets: (Weighing approx. 5 lb and containing exactly 2 lb of Mn and approx. 2 lb of Si). Contract, c.l. bulk 12.6c per lb of briquet, c.l. packaged 13.4c; ton lot 14.2c; less ton 15.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size weighing approx. 2 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.3c per lb of briquet. Packed c.l. 7.0c; ton lot 8.2c; less ton 8.8c. Delivered. Spot, add 0.25c.

(Small size Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 9.1c. Packed c.l. 9.25c; ton lot 9.9c; less ton 9.9c. Delivered. Add 0.25c for notching. Small size only. Spot, add 0.25c.

Molybdic oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained. f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80% W) 5000 lb W or more $3.50 per lb of contained W, 2000 lb W to 5000 lb W $3.70, less than 2000 lb W, $4.02. f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max., C 0.1% max.) Contract, ton lot, 2" x D, $9.00 per lb of contained Cb, less ton $9.20. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min., C 0.10% max.) ton lots, 2" x D, $4.75 per lb of contained Cb plus Ta, deld., less ton lots $4.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.60-0.75%) Carload packed 1" x D, 4c per lb of alloy, ton lot 4.7c; less ton lot Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.) Contract, carload, packed, 1" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.3c. Deld. Spot, add 0.25c.

Graphidox No. 1: (Si 48-52%, Ca 5-7%, Ti 9-11%, Al 2%) packed 17.00c per lb of alloy, ton lots 18.00c, less ton lots 20c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

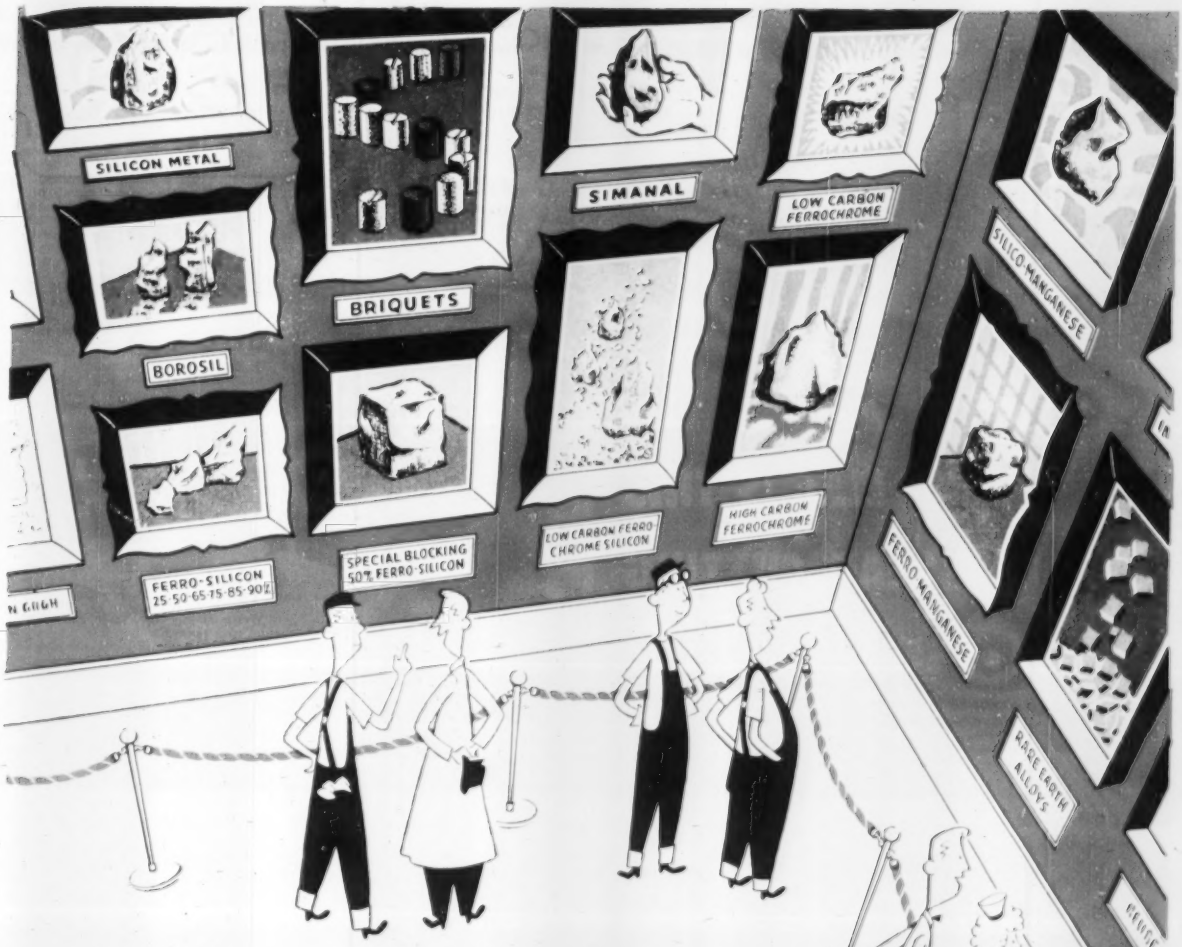
V-3 Foundry Alloy: (Cr 28-42%, Si 17-19%, Mn 8-11%, C) packed 16.6c per lb of alloy, ton lots 18.10c, less ton lots 19.35c, f.o.b. Niagara Falls, freight allowed to St. Louis.

Sinanal: (Approx 20% each Si, Mn, Al, Ba, Fe) Lump, carload, bulk 14.5c. Packed c.l. 15.5c; ton lots 16.75c; less ton lots, 16.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% basis on 24% P content with analysis of $4 for each 1% of P above or below the basis), carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $80 per gross ton.

Ferromolybdenum: (55-75%) Per lb contained Mo, f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41. Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic oxide: Per lb contained Mo, f.o.b. Langeloth, Pa., $1.41 in cans or bags, $1.43, f.o.b. Langeloth, Pa.; Washington, Pa., $1.43.



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- SILICO-MANGANESE
- BOROSIL
- SIMANAL
- RARE EARTH ALLOYS
- LOW CARBON FERROCHROME

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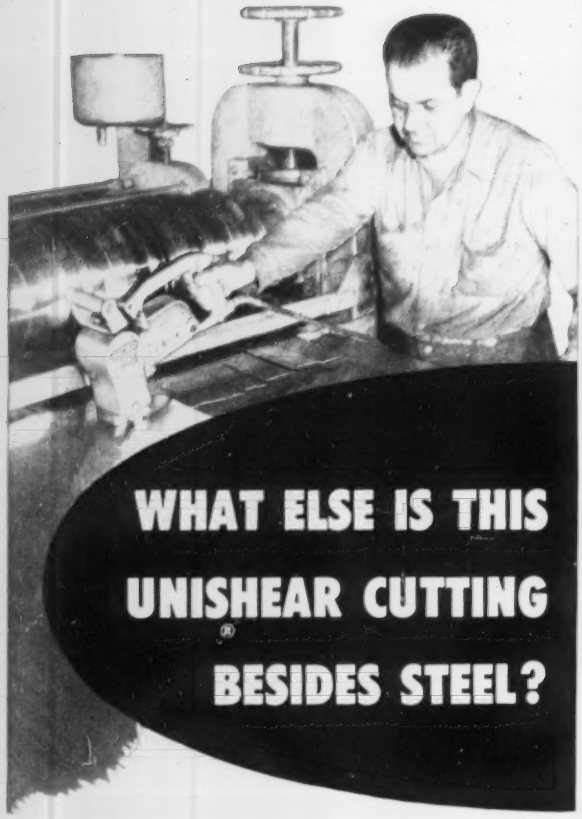

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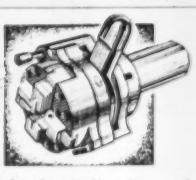

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ORES–COKE–REFRACTORIES

Prices as reported to STEEL; changes shown in italics.

ORES

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%	20.00
North African hematite (spot)	20.00-22.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, before duty

Foreign Wolframite, good commercial quality	17.00-17.50
Domestic scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, $1.02-$1.05 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; 46-47%, $0.95-$0.97.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.:

Indian and African

48% 2.8:1	$40.00-$42.00
48% 3:1	44.00-46.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$24.00-$26.00
48% no ratio	34.00

Domestic

(Rail nearest seller)

48% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb. Mo content, mines, unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard:

50-60%	$2.40-$2.80
65% min.	$3.40-$3.50

Vanadium Ore

Cents per lb. V_2O_5 content, deld. mills

Domestic	31.00

REFRACTORIES

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $109; Salina, Pa., $114; Niles, O., $120; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $115; Warren, O., Hays, Pa., $120; Niles, O., $120; E. Chicago, Ind., Joliet, Rockdale, Ill., $125; Cutler, Utah, $116.50; Los Angeles, $122.85.

Insulating Fire Brick

2300° F.: Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $77.50; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Perla, Ark., $109; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $149.70; Johnstown, Pa., $140; Clearfield, Pa., $148.50; St. Louis, $151.80; Athens, Tex., $155.

Nozzles

Reesdale, Pa., $223.50; Johnstown, Pa., $229.20; Clearfield, Pa., $241.40; St. Louis, $247.10; Athens, Tex., $247.70.

Runners

Reesdale, Pa., $174; Johnstown, Pa., $177.80; Clearfield, Pa., $185.50; St. Louis, $187.30; Athens, Tex., $191.80.

High-Alumina Brick

50 *Per Cent*: Clearfield, Pa., St. Louis, Mexico, Mo., $179; Danville, Ill., $169.30.

60 *Per Cent*: St. Louis, Mexico, Vandalia, Mo., $223.00; Danville, Ill., $213.20.

70 *Per Cent*: St. Louis, Mexico, Vandalia, Mo., $225; Danville, Ill., $258; Clearfield, Pa., $252.

Dolomite

Domestic, dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Narlo, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $14.60; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite

Domestic, deadburned bulk; Luning, Nev., $18.

METALLURGICAL COKE

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-$15.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearney, N. J., ovens	$24.00
Everett, Mass., ovens	
New England, deld.	*26.00
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, deld.	28.12
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	23.95
Swedeland, Pa., ovens	23.85
St. Louis, ovens	
St. Louis deld.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Buffalo, deld.	28.08
Flint, deld.	28.23
Pontiac, deld.	27.00
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	40.00
Toluol, one deg.	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$44-$47
Birmingham area	45.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol, 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

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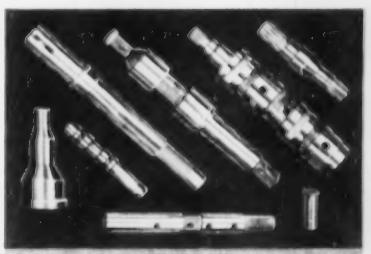
(Threaded with nipple, unboxed, f.o.b. plant)

GRAPHITE

Diam., Inches	Length	Per 100 lb
2	24	$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5½	40	25.75
6	60	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18	72	20.50
20	72	20.00

CARBON

40	100	$8.95
40, 35, 30	110	8.95
30	84	9.10
24	96	8.90
24	72, 84	9.10
20	90	8.95
20	84	9.10
17	72	9.10
17	60	9.50
14	72	9.50
14, 12, 10	60	10.30
8	60	10.55



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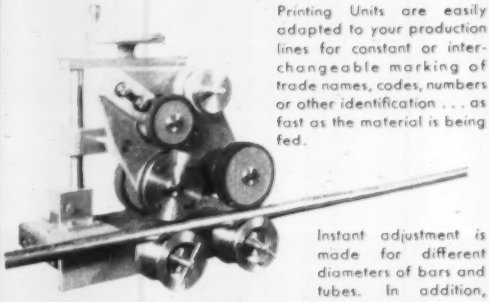

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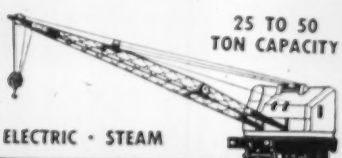

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THE OHIO LOCOMOTIVE CRANE CO.
BUCYRUS, OHIO

Scrap Market Sentiment Is Improving

Slightly stronger tone noted at various consuming points despite absence of large buying of dealer grades. Brokers encounter difficulty covering commitments at low prices

Chicago The scrap market carried a stronger tone here for the second straight week giving rise to the belief some stabilization is either here or imminent. A small sale of No. 2 heavy melting at $27 a ton was an advance of $2. No. 1 heavy melting is up $1 to $28. Buying of all scrap is light but this is to be expected with the steelmaking rate losing further ground.

Philadelphia Prices on major grades of steel scrap again are unchanged, also on lesser steel items, except for an adjustment in mixed borings and turnings to $12 a ton, delivered, and an advance of $1 in rail crops, 2 feet and under, to $11 delivered.

Meanwhile, cast iron grades are moving slightly upward, following a steady market of several weeks duration. The minimum price of $34 on No. 1 cupola has disappeared with the market now $35 delivered. Drop broken machinery is now $41 delivered.

Further easing of scrap export restrictions is likely to have little bearing here because of the proximity of domestic consumers, making it more competitive for foreign buyers than at certain other ports.

Cleveland Despite continued absence of active buying of dealer scrap in this market, prices on some steelmaking and cast grades are up about $1 per ton sentimentally. The advances result from the fact brokers are having difficulty obtaining material at the low prices offered, and reported substantial buying in the Chicago market which involved the movement of some scrap from the Detroit area. Continued deterioration of the Indo-China political situation also is a factor for returning strength.

Detroit Scrap prices here turned upward somewhat last week as increased buying in the Chicago area resulted in the moving of some material from this district. Boatloads of scrap are reported headed for Buffalo, creating a slight flurry in an otherwise depressed market.

New York Scrap brokers' buying prices are unchanged, but the thought prevails that once an upturn develops prices will advance sharply. Brokers are having difficulty covering on commitments.

Youngstown Scrap dealers here are concerned about the lack of buying. Reports of growing scrap market strength have been buoying hopes but there has been no evidence of sales here to back up the better feeling.

Pittsburgh Prices on blast furnace grades generally increased $1 last week. Higher prices are being paid for superior grades, although demand remains low over-all. Increased activity in neighboring areas is partially responsible for the slight rise here.

Boston In the absence of buying, steel scrap prices are unchanged. Yard stocks are heavy in most cases and dealers are taking in little tonnage. On what small buying is being done, consumers are limiting freight hauling costs to $1.

Buffalo The scrap market here has pulled out of the doldrums with steelmaking grades jumping $1 per ton and blast furnace items going up as much as $3.

Cincinnati The No. 2 grades of open hearth scrap climbed $1 a ton last week reflecting higher mill prices. Machine shop turnings and short shovel turnings also are $1 higher.

St. Louis Stronger undertone marks the scrap market. Rail grades would be higher were it not for uncertainty whether recent heavy mill buying will continue. Minor rises have occurred in steel grades, but they are primarily inter-city price adjustments.

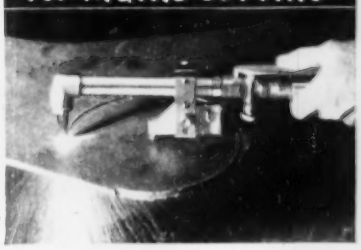
Seattle The scrap market is slow. Larger buyers are inactive, having well rounded inventories and purchasing occasionally as good offers are made.

Los Angeles Bethlehem Pacific Coast Steel Corp.'s inventory of 16,000 tons of steelmaking scrap is sufficient for 60 days production. Only small tonnages of steelmaking scrap are moving.

Toronto, Ont. Canadian scrap steel prices broke another $1 to $2 per ton, bringing No. 1 heavy melting and No. 1 bundles to $22, delivered Hamilton. No. 2 heavy melting and No. 2 Bundles to $19 and $17, respectively, and turnings to $12.

Cast scrap is firmer at $42 to $45 delivered. Local dealers report only small supplies of cast scrap.

THREE NEW GUIDES for METAL CUTTING



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IRON AND STEEL SCRAP

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

April 8	$25.33
April 1	24.50
Mar. Avg.	24.37
Apr. 1953	42.88
Apr. 1949	24.06

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plants)

No. 1 heavy melting	*26.00-27.00*
No. 2 heavy melting	*24.00-25.00*
No. 1 bundles	*26.00-27.00*
No. 2 bundles	*22.00-24.00*
No. 1 busheling	*26.00-27.00*
Machine shop turnings	*14.00-15.00*
Mixed borings, turnings	*14.00-15.00*
Short shovel turnings	*17.00-18.00*
Cast iron borings	*17.00-18.00*
Cut structurals	27.00-28.00
Heavy turnings	26.00-27.00
Punchings & plate scrap	*28.00-29.00*
Electric furnace bundles	28.00-29.00

Cast Iron Grades

No. 1 cupola	*36.00-37.00*
Charging box cast	33.00-34.00
Heavy breakable cast	30.00-31.00
Unstripped motor blocks	24.00-25.00
No. 1 machinery cast	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt	28.00-29.00
Rails, 2 ft and under	44.00-45.00
Rails, 18 in. and under	45.00-46.00
Rails, random lengths	38.00-39.00
Railroad specialties	33.00-34.00

Stainless Steel Scrap

(F.o.b. shipping point)

18-8 bundles & solids	165.00-170.00
18-8 turnings	55.00-60.00
430 bundles & solids	55.00-57.00
430 turnings	50.00-52.00

CLEVELAND

(Delivered consumer plants)

No. 1 heavy melting	*27.00-27.00*
No. 2 heavy melting	25.00-25.00
No. 1 bundles	*27.00-27.00*
No. 2 bundles	25.00-26.00
No. 1 busheling	*27.00-27.00*
Machine shop turnings	*16.00-17.00*
Mixed borings, turnings	*17.50-18.50*
Short shovel turnings	*17.50-18.50*
Cast iron borings	*17.50-18.50*
Low phos.	*27.50-28.50*
Alloy free, short shovel turnings	*17.50-18.50*
Electric furnace bundles	*27.00-28.00*

Cast Iron Grades

No. 1 cupola	*38.00-39.00*
Charging box cast	*34.00-35.00*
Stove plate	*34.00-35.00*
Heavy breakable cast	*34.00-34.00*
Unstripped motor blocks	*32.00-33.00*
Brake shoes	*28.00-29.00*
Clean auto cast	*39.00-40.00*
No. 1 wheels	*41.00-42.00*
Burnt cast	*28.50-29.50*
Drop broken machinery	*39.00-40.00*

Railroad Scrap

No. 1 R.R. heavy melt	25.00-26.00
R.R. malleable	38.00-39.00
Rails, 3 ft and under	44.00-45.00
Rails, 18 in. and under	44.00-45.00
Rails, random lengths	37.00-38.00
Cast steel	32.00-33.00
Railroad specialties	32.00-33.00
Uncut tires	34.00-35.00
Angles, splice bars	38.00-39.00
Rails, rerolling	38.00-39.00

Stainless Steel

(F.o.b. shipping point)

18-8 bundles, solids	nom. 160.00-170.00
18-8 turnings	nom. 70.00-80.00
430 clips, bundles, solids	nom. 70.00-80.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer plants)

No. 1 heavy melting	*24.00-25.00*
No. 2 heavy melting	20.00-21.00
No. 1 bundles	*24.00-25.00*
No. 2 bundles	18.00-19.00
Machine shop turnings	*11.00-12.00*
Short shovel turnings	*17.00-18.00*
Cast iron borings	*17.00-18.00*
Low phos.	25.00-26.00
Electric furnace bundles	*24.00-25.00*

Railroad Scrap

No. 1 R.R. heavy melt	26.00-27.00

PHILADELPHIA

(Delivered consumer plants)

No. 1 heavy melting	22.00
No. 2 heavy melting	20.00
No. 1 bundles	22.00
No. 2 bundles	18.00
No. 1 busheling	22.00*
Electric furnace bundles	23.00-23.50
Machine shop turnings	11.00
Mixed borings, turnings	*12.00*
Short shovel turnings	16.00*
Structurals & plate	26.00-27.00
Heavy turnings	20.00
Couplers, springs, wheels	39.00
Rail ends 2 ft 3 under	*41.00*

Cast Iron Grades

No. 1 cupola	*35.00*
Malleable	*39.00*
Heavy breakable cast	36.50-37.50
Unstripped motor blocks	28.00*
Drop broken machinery	*41.00*

*Nominal

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	14.00
No. 2 heavy melting	12.00
No. 1 bundles	14.00
No. 2 bundles	10.00
Machine shop turnings	4.00*
Mixed borings, short turnings	6.00*
Low phos. (structural & plate)	26.00
Short shovel turnings	8.00-9.00*

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unstripped motor blocks	21.00-22.00*

Stainless Steel

18-8 sheets, clips, solids	160.00-165.00
18-8 borings, turnings	70.00-75.00
430 sheets, clips, solids	50.00
410 sheets, clips, solids	50.00

*Nominal

BOSTON

(Brokers' buying prices f.o.b. shipping point)

No. 1 heavy melting	13.25-14.00
No. 2 heavy melting	9.25-11.25
No. 1 bundles	13.25-14.25
No. 2 bundles	7.25-9.25
Machine shop turnings	3.00-3.50
Mixed borings, turnings	3.00-3.50
Short shovel turnings	6.50-7.00
No. 1 cast	29.00-30.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast	36.00-37.00

CINCINNATI

(Brokers' buying prices, f.o.b. shipping point)

No. 1 heavy melting	22.00-23.00
No. 2 heavy melting	*19.00-20.00*
No. 1 bundles	22.00-23.00
No. 2 bundles	*19.00-20.00*
No. 1 busheling	22.00-23.00
Machine shop turnings	*10.00-11.00*
Mixed borings, turnings	10.00-11.00
Short shovel turnings	*14.00-14.00*
Cast iron borings	10.00-11.00
Low phos. 18 in.	30.00-31.00

Cast Iron Grades

No. 1 cupola	37.00
Heavy breakable cast	29.00
Charging box cast	36.00
Drop broken machinery	40.00

Railroad Scrap

No. 1 R.R. heavy melt	26.00-27.00
Malleable	32.00-33.00
Angles, splice bars	42.00-43.00
Rails, random lengths	34.00-35.00

CHICAGO

No. 1 heavy melting	*27.00-28.00*
No. 2 heavy melting	*26.00-27.00*
No. 1 factory bundles	27.00-28.00
No. 1 dealer bundles	25.00-26.00
No. 2 bundles	17.00-19.00
No. 1 busheling	25.00-27.00
Machine shop turnings	*11.00-12.00*
Mixed borings, turnings	12.00-13.00
Short shovel turnings	13.00-14.00
Cast iron borings	13.00-14.00
Cut structurals, 3-ft	30.00-31.00
Punchings & plate scrap	*31.00-32.00*
Electric furnace bundles	28.00-29.00

Cast Iron Grades

No. 1 cupola	35.00-37.00
Stove plate	27.00-28.00
Unstripped motor blocks	24.00-25.00
Clean auto cast	36.00-38.00
Drop broken machinery	36.00-38.00

Railroad Scrap

No. 1 R.R. heavy melt.	*29.00-30.00*
R.R. malleable	39.00-40.00
Rails, 2 ft. and under	*41.00-42.00*
Rails, 18 in. and under	*42.00-43.00*
Angles, splice bars	35.00-36.00
Rails, rerolling	34.00-35.00

Stainless Steel Scrap

18-8 clips & solids	130.00-140.00
18-8 turnings	60.00
430 clips & solids	40.00-42.00
430 turnings	20.00-22.00

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 1 heavy melting	*17.00*
No. 2 heavy melting	14.50
No. 1 bundles	*18.00*
No. 2 bundles	14.50
No. 1 busheling	*18.00*
Machine shop turnings	*5.50*
Mixed borings, turnings	*5.50*
Short shovel turnings	*8.50*
Punchings & plate scrap	*20.00*

Cast Iron Grades

No. 1 cupola	36.00
Charging box cast	34.00
Stove plate	28.00
Heavy breakable	25.00
Unstripped motor blocks	18.00
Clean auto cast	40.00
Malleable	28.00

BUFFALO

No. 1 heavy melting	*23.00-24.00*
No. 2 heavy melting	*19.50-20.50*
No. 1 bundles	*23.00-24.00*
No. 2 bundles	*17.50-18.50*
No. 1 busheling	*20.50-21.50*
Machine shop turnings	*14.00-15.00*
Mixed borings, turnings	*16.50-17.00*
Short shovel turnings	*17.50-18.00*
Cast iron borings	*16.50-17.00*
Low phos.	27.50-28.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	34.00-35.00
No. 1 machinery	37.00-38.00

Railroad Scrap

Rails, random lengths	*33.00-34.00*
Rails, 3 ft and under	*40.00-41.00*
Railroad specialties	31.50-32.50

BIRMINGHAM

No. 1 heavy melting	19.00-20.00
No. 2 heavy melting	17.00-18.00
No. 1 bundles	19.00-20.00
No. 2 bundles	15.00-16.00
No. 1 busheling	19.00-20.00
Cast iron borings	13.00-14.00
Short shovel turnings	14.00-15.00
Machine shop turnings	12.00-13.00
Electric furnace bundles	24.00-26.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	39.00-40.00
Charging box cast	28.00-29.00
Stove plate	36.00-37.00
Bar crops and plate	28.00-29.00
Structural, plate 2 ft	28.00-29.00
Heavy breakable cast	28.00-29.00
Unstripped motor blocks	32.00-33.00
No. 1 wheels	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt	23.00-24.00
Rails, 18 in. and under	39.00-40.00
Rails, random lengths	32.00-33.00
Angles, splice bars	35.00-36.00
Stand. steel axles	35.00-36.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	*24.00-25.00*
No. 2 heavy melting	*24.25*
No. 1 bundles	*24.00-25.00*
No. 2 bundles	*19.00-20.00*
Machine shop turnings	*10.00-11.00*
Short shovel turnings	*12.00-13.00*

Cast Iron Grades

No. 1 cupola	*37.00*
Charging box cast	35.00
Heavy breakable cast	33.00
Unstripped motor blocks	*27.00*
Brake shoes	30.00
Clean auto cast	*39.00*
Stove plate	*29.00*

Railroad Scrap

No. 1 R.R. heavy melt	29.00
Rails, 18-in. and under	38.00
Rails, random lengths	*44.00*
Rails, rerolling	37.00
Uncut tires	30.00
Angles, splice bars	33.00

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting	23.00
No. 2 heavy melting	19.00
No. 1 bundles	22.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Machine shop turnings	11.50
Mixed borings, turnings	11.50
Short shovel turnings	11.50
Electric furnace, No. 1	35.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	30.00-35.00
Heavy breakable cast	25.00
Unstripped motor blocks	23.00
No. 1 wheels	21.00
Stove plate (f.o.b. plant)	28.00
Brake shoes	28.00

Railroad Scrap

(Delivered consumer plant)

Rails, random lengths	30.00-34.00

SAN FRANCISCO

No. 1 heavy melting	20.00
No. 2 heavy melting	16.00
No. 1 bundles	19.00
No. 2 bundles	16.00
No. 1 busheling	20.00
Machine shop turnings	5.00
Mixed borings, turnings	5.00
Short shovel turnings	9.00
Cast iron borings	9.00
Cut structurals	25.00
Heavy turnings	9.00
Punchings & plate scrap	25.00
Electric furnace bundles	19.00

Cast Iron Grades

No. 1 cupola	39.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	29.00
Brake shoes	32.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	25.00
Drop broken machinery	42.00

LOS ANGELES

No. 1 heavy melting	20.00
No. 2 heavy melting	16.00
No. 1 bundles	18.00
No. 2 bundles	16.00
Machine shop turnings	5.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	35.00-38.00

HAMILTON, ONT.

(Delivered prices)

No. 1 heavy melting	*$22.00*
No. 2 heavy melting	*19.00*
No. 1 bundles	*22.00*
No. 2 bundles	*17.00*
Mixed steel scrap	*16.00*
Mixed borings, turnings	*12.00*
Rails, remelting	*32.00*
Busheling, new factory	
Prepared	*20.00*
Unprepared	*16.00*
Short steel turnings	*12.00*

Cast Iron Grades†

No. 1 machinery cast	*42.00-45.00*

†F.o.b. shipping point.

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President
United States Rubber Company

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Write today to Savings Bond Division, U. S. Treasury Department, Washington, D. C. Tell them you want to join the United States Rubber Company and the 45,000 other companies that are making an important contribution to national security and a sounder dollar.

Your State Director, U. S. Savings Bond Division, will contact you promptly. He will explain the simple procedure of installing the Plan and will show you how to conduct a simple, person-to-person canvass that will put a Payroll Savings Application Blank in the hands of every man and woman in your plant and offices.

That's all you have to do. Your employees will do the rest. They are as interested in their own future as you are in yours. Give them an opportunity to build personal security for themselves and a better America for their children.

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Advertising Index

Acme Steel Co., Acme Steel Products Division	17, 18, 19, 20
Aetna-Standard Engineering Co., The	Inside Back Cover
Air Reduction	71
Ajax Engineering Corporation	21
Allegheny Ludlum Steel Corporation	22
Allis-Chalmers	Inside Front Cover
Allis, Louis, Co., The	141
American Brass Co., The, American Metal Hose Branch	79
American Chain & Cable, American Chain Division	158
American Chemical Paint Co.	178
American Gas Furnace Co.	31
American MonoRail Co.	8
American Screw Co.	116
American Steel & Wire Division, United States Steel Corporation	34
American Welding & Manufacturing Co., The	38
American Wheelabrator & Equipment Corporation	32
American Zinc, Lead & Smelting Co.	149
American Zinc Sales Co.	149
Anti-Corrosive Metal Products Co., Inc.	135
Armstrong-Blum Mfg. Co.	41
Atlas Car & Mfg. Co., The	10
Baker, J. E., Co., The	121
Baker-Raulang Co., The	57
Beatty Machine & Mfg. Co.	164
Bedford Foundry & Machine Co., Inc.	12
Belmont Iron Works, The	174
Bethlehem Steel Co.	1
Brad Foote Gear Works, Inc.	63
British Columbia Department of Trade & Industry	174
Cadman, A. W., Mfg. Co.	172
Camcar Screw & Mfg. Corporation	13
Carlson, G. O., Inc.	142
Challenge Machinery Co., The	16
Chambersburg Engineering Co.	161
Chemical Corporation, The	5
Chicago Steel Service Co.	124
Cincinnati Grinders, Inc.	58
Cincinnati Shaper Co., The	9
Clark Controller Co., The	85
Cleveland Crane & Engineering Co., The, Cleveland Tramrail Division	68
Cleveland Steel Tool Co., The	174
Cold Metal Products Co., The	105
Columbia-Geneva Steel Division, United States Steel Corporation	34
Columbus McKinnon Chain Corporation	125
Crucible Steel Company of America	36
Cullen-Friestedt Co.	166
Detroit Broach Co.	108, 109
Detroit Steel Corporation, Reliance Steel Division	42
Dolan Steel Co., Inc.	155
Dulien Steel Products, Inc.	179
Eastern Machine Screw Corporation, The	172
Easton Car & Construction Co.	166
Ederer Engineering Co.	139
Electric Controller & Mfg. Co., The	96
Electric Equipment Co.	179
Electro Manganese Corporation	173
Federal Bearings Co., Inc., The	77

(Continued on Page 180)

Pig Iron . . .

Pig Iron Prices, Page 151

Cleveland Spotty foundry operations continue. Some shops are on a 5-day week but others are operating only 3 and 4 days weekly. The situation in the foundry trade is best described as one of cautious optimism with some interests noting a slight pickup in castings orders.

Demand for agricultural equipment castings is slightly better, and so is construction equipment, while machine tool castings are reported in continued steady demand.

Despite the slight improvement in sentiment among the foundrymen they are not increasing their demand for pig iron. In fact, they continue to order tonnage from the furnaces as needed.

Boston Malleable melt is a shade heavier with a few shops moderately increasing operations. Gray iron foundries generally remain on a 4-day week schedule with order backlogs light. Melt with steel producers is substantially under capacity.

Iron supply is plentiful, and most furnaces are equalizing with Troy, N. Y. in larger range of territory.

New York Business in pig iron has gotten off to a slow start this month. There has been little or no improvement in foundry operations and some iron sellers doubt the April tonnage movement will be even as good as that in March.

Buffalo Although pig iron demand continues spotty there is an indication one idle stack here will be relighted shortly on basic iron. Another producer on merchant iron relighted a furnace but simultaneously withdrew another furnace for relining.

Philadelphia With four district blast furnaces scheduled to go down this week there will not be the accumulation of iron in sellers' yards that there has been, but indications are there will be no shortage.

Youngstown U. S. Steel Corp. banked its No. 2 blast furnace at the Ohio Works due to reduction in business.

Chicago Some pig-iron consumers are holding close rein on their purchases. Since inventories are being maintained at minimum, increases in orders for gray iron castings result in foundries seeking quick deliveries on additional lots of iron. There is enough of this going on to keep April volume close to March level.

Of Chicago district's 13 blast furnaces, only 29 are in blast currently.

St. Louis Pig iron demand has dropped further with the closing of American Steel Foundries here.

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ELECTRIC FURNACE SUPERINTENDENT. Large integrated steel plant producing stainless and quality alloy steels interested in high grade man having college education or equivalent and experience to produce quality steel. Must be capable of leading and training organization and efficiently managing department. Opportunity for man who can meet these qualifications. Reply Box 939, STEEL, Penton Bldg., Cleveland 13, Ohio.

PROCESS CONTROL METALLURGIST. Large integrated steel plant, Pittsburgh district, interested in man with metallurgical education and experience in melting and rolling of stainless and alloy steels. Must have experience and qualifications to manage organization of technical men, supervising metallurgical control and processing operations of electric furnace and open hearth quality steels. Reply Box 940, STEEL, Penton Bldg., Cleveland 13, Ohio.

ASSISTANT TO PRESIDENT of large machinery manufacturer located in East with experience in manufacture of heavy machinery, shop administration, technical background and ability to embrace larger responsibilities such as works manager. Full details please which will be held in strict confidence. Reply Box 943, STEEL, Penton Building, Cleveland 13, Ohio.

YOUNG METALLURGICAL ENGINEER with Sales contact experience for sales and product development work in connection with hot extrusion of alloy and stainless steels. A real opportunity for a graduate metalurgical engineer with good personality who possesses a high degree of judgment, perseverance and drive. Position is with an old established firm rated among the top in its field. Write in confidence giving complete and full details to Box 947, STEEL, Penton Building, Cleveland 13, Ohio.

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WANTED: MANUFACTURER'S AGENTS in all parts of the country by long time manufacturer of hydraulic machinery desirous of increasing participation in this field. Interested only in persons or organizations possessing sound background in hydraulic press use and application. Write full details to Box 952, STEEL, Penton Building, Cleveland 13, Ohio.

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Twenty years' experience Steel Manufacture Fabrication, Warehousing-Production Planning Inventory Control Systems Cost Etc. Prefer New England Area. Reply Box 953 STEEL, Penton Building, Cleveland 13, Ohio.

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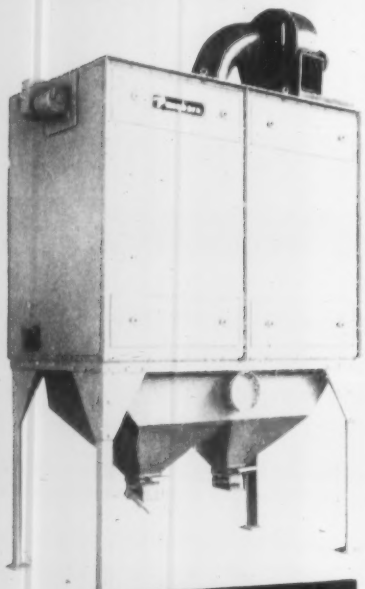

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DUST CONTROL

Stops the Dust Hog From Eating Profits

Pangborn's 50th Anniversary
1904 - 1954

Advertising Index

(Concluded from Page 178)

Federal-Mogul Corporation 113
Fetters Co., The 27
Fischer Special Manufacturing Co. 82

General Electric Co. 37
Giddings & Lewis Machine Tool Co. 14, 15
Great Lakes Steel Corporation 60

Hanlon-Gregory Galvanizing Co. 134
Hannifin Corporation 7
Hartford Special Machinery Co., The 117
Heald Machine Co., The 2
Hevi Duty Electric Co. 138
Horsburgh & Scott Co., The 78
Hubbard, M. D., Spring Co. 172

Independent Engineering Co., Inc. 169
Indiana Metal Products Corporation 172
Ingersoll-Rand 64
Inland Steel Co. 46
Iron & Steel Products, Inc. 179

Jones & Laughlin Steel Corporation 127

Kearney & Trecker Corporation 73
Kenilworth Steel Co., The 67

Lapham-Hickey Co. 74
Levco Corporation 120
Lewis Machine Co., The 168
Lindberg Engineering Co. 80
Lindberg Steel Treating Co. 159
Linde Air Products Co., A Division of Union Carbide & Carbon Corporation 111
Link-Belt Co. 23

McDanel Refractory Porcelain Co. 168
McGill Manufacturing Co., Inc. 106

Mackintosh-Hemphill Co. 133
Magnethermic Corporation 29
Manheim Manufacturing & Belting Co. 35
Marchant, Geo. F., Co. 169
Marlin-Rockwell Corporation 11
Matthews, Jas. H., & Co. 174
Michigan Steel Tube Products Co. 81

National Steel Corporation 60
New Era Engineering Co. 175
Niagara Machine & Tool Works 24, 25
Nilson, A. H., Machine Co., The 126

Ohio Ferro-Alloys Corporation 171
Ohio Locomotive Crane Co., The 174
Osborn Manufacturing Co., The 3
Ottawa Steel Products, Inc. 173

Pangborn Corporation 180
Parker Rust Proof Co. 167
Peters-Dalton, Inc. 163
Pollack, William B., Co., The 83

Reading Crane & Hoist Corporation 160
Reliance Steel Division, Detroit Steel Corporation 42
Republic Steel Corporation, Alloy Steel Division 28
Rolock, Inc. 84
Ryerson, Joseph T., & Son, Inc. 45

Salem-Brosius, Inc. 95
Sandvik Steel, Inc. 137
Square D Co. 33
Stanley Works, The, Stanley Electric Tools Division 172

Tennessee Coal & Iron Division, United States Steel Corporation 34
Thomas Flexible Coupling Co. 136
Timken Roller Bearing Co., The, Steel & Tube Division Back Cover

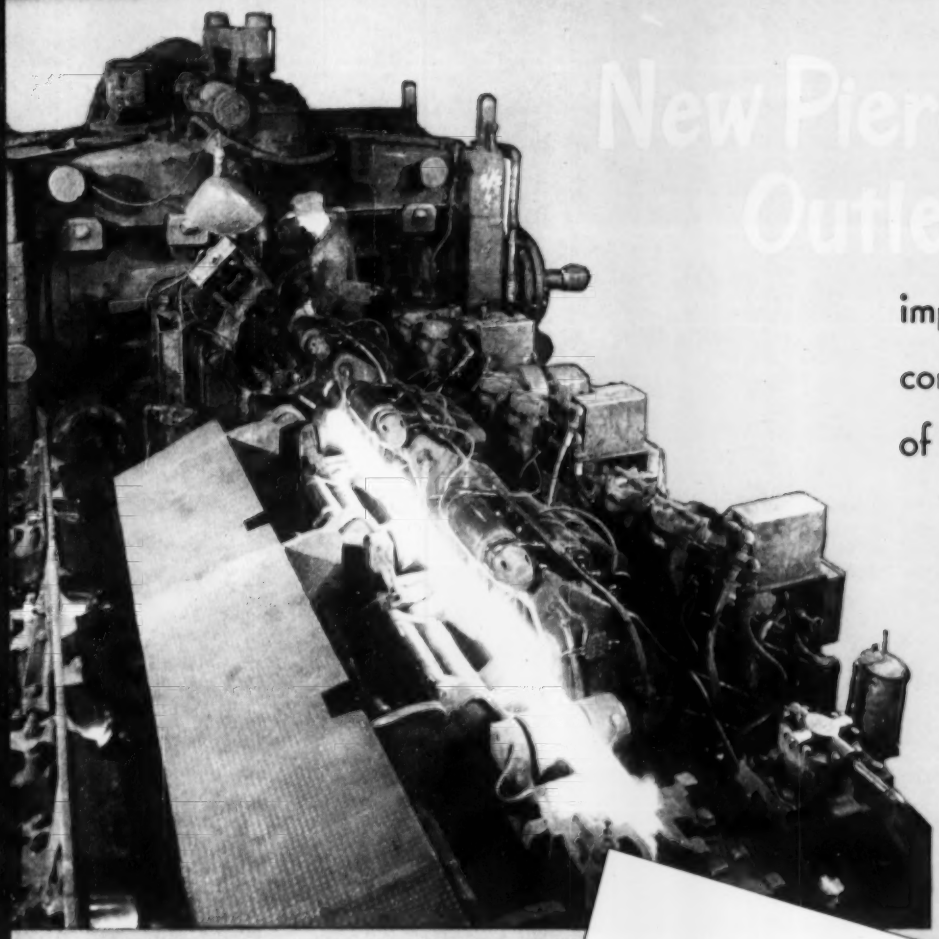
Ulbrich Stainless Steels 6
Union Carbide & Carbon Corporation, Linde Air Products Co. 111
United States Graphite Co., The 76
United States Rubber Co., Mechanical Goods Division 165
United States Steel Corp., Subsidiaries 34, 130
United States Steel Export Co. 34
United States Steel Supply Division, United States Steel Corporation 130

Van Huffel Tube Corporation 173
Vreeder-Raot, Inc. 4

Ward Steel Co. 175
Wean Equipment Corporation 114, 115
Wheeling Steel Corporation 30
Wheland Co., The 178

Table of Contents, Page 5

Classified Advertising, Page 179



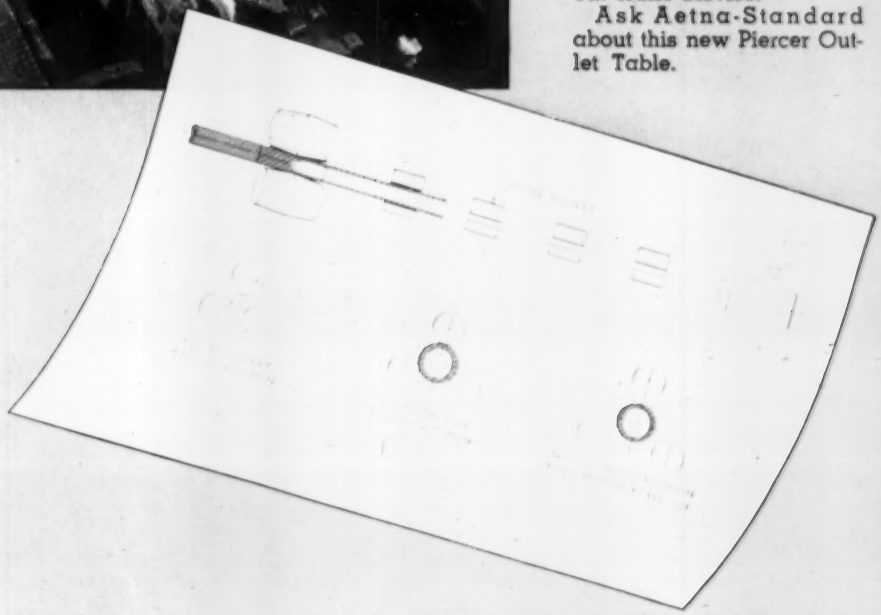
New Piercer Outlet Table

improves concentricity of tubes

The same rollers guide both piercer bar and tube, assuring three advantages: (1) positive guiding of bar; (2) improved outside tube surface; (3) more uniform concentricity from end to end of tube.

On the operating side, the setting for different rolling schedules (changes in bar or tube diameter) requires only a few minutes . . . without crane service.

Ask Aetna-Standard about this new Piercer Outlet Table.



features

1. Same rollers guide piercer bar and tube (see diagram).
2. Guide rollers open automatically from bar guiding to tube guiding position as pierced tube leaves piercing mill.
3. Indicators allow quick setting of guide rollers to suit respective mandrel bar and O. D. tube sizes.
4. Roller guides are adjustable for full range of piercing mill from minimum diameter bar to maximum O. D. tube.
5. Simple, rugged design.

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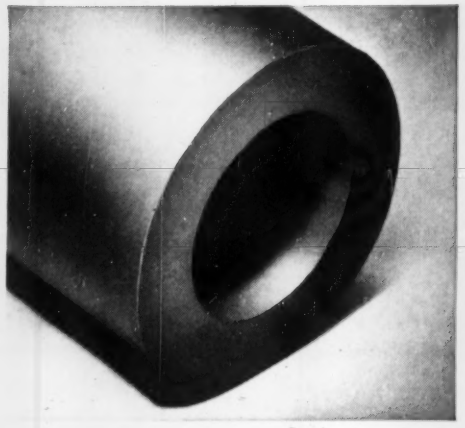
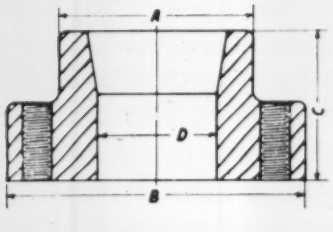
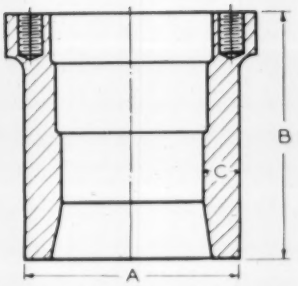
Making ring-shaped tool steel parts?

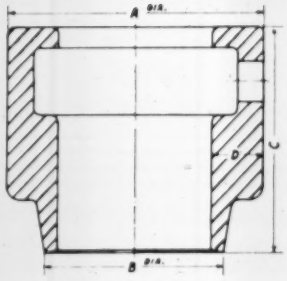




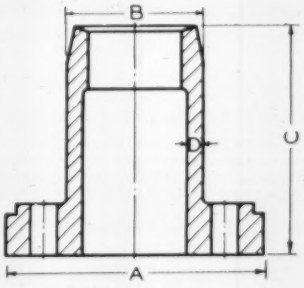
SIZING DIE



BLANKING AND FORMING DIE



UPSETTER DIE



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BY using Graph-Mo Hollow-Bar*, makers of ring-shaped tool steel parts can start with finish boring. There's no drilling—the hole's already there. Production is speeded up, scrap waste cut and steel saved.

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For more information about Graph-Mo Hollow-Bar, write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, O. Cable address: "TIMROSCO".

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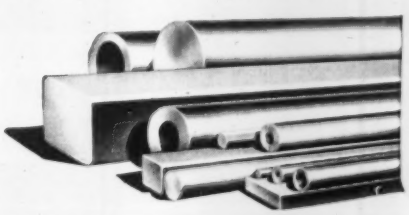

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